EPC STORMWATER REVIEW COMMENTS
IN ORANGE BOXES WITH BLACK TEXT

JOHNSON DEVELOPMENT ASSOCIATES

CONSTITUTION STORAGE

LOT 1, EIGHT LINE SUBDIVISION LOCATED IN THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

FINAL GRADING & EROSION CONTROL PLANS

PROJECT CONTACTS

PROPERTY OWNER
JASPERCO, LLC.
5532 SADDLE ROCK TRAIL
COLORADO SPRINGS, CO 80918
ATTN: TONY COLON
EMAIL: TONYC@COLONFAM.COM

APPLICANT
JOHNSON DEVELOPMENT ASSOCIATES, INC.
100 DUNBAR STREET, SUITE 400
SPARTANBURG, SC 29306
TELE: (864) 529-1297
ATTN: BRIAN KEARNEY
EMAIL: BKEARNEY@JOHNSONDEVELOPMENT.NET

CIVIL ENGINEER
GALLOWAY & CO., INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, CO 80920
TELE: (719) 900-7220
ATTN: GRANT DENNIS, P.E.
EMAIL: GRANTDENNIS@GALLOWAYUS.COM

GEOTECHNICAL ENGINEER
ROCKY MOUNTAIN GEOTECHNICAL, INC
555 E. PIKES PEAK AVE, SUITE 107
COLORADO SPRINGS, CO 80903
TELE: (303) 634-1999
ATTN: KENNETH L. MEYERS, PE

TRAFFIC ENGINEER
GALLOWAY & CO., INC.
5500 GREENWOOD PLAZA BLVD, SUITE 200
GREENWOOD VILLAGE, CO 80111
TELE: (303) 770-8884
ATTN: BRIAN HORAN, P.E.
EMAIL: BRIANHORAN@GALLOWAYUS.COM

SURVEYOR
GALLOWAY & CO., INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, CO 80920
TELE: (719) 337-1262
ATTN: BRIAN DENNIS
EMAIL: BRIANDENNIS@GALLOWAYUS.COM

UTILITY CONTACTS

WATER & WASTEWATER
CHEROKEE METROPOLITAN DISTRICT
6250 PALMER PARK BLVD.
COLORADO SPRINGS, CO 80915
TELE: (719) 597-5080
ATTN: KEVIN BROWN
EMAIL: KBROWN@CHEROKEEMETROPOLITAN.ORG

ELECTRIC
MOUNTAIN VIEW ELECRIC
11140 E WOODMEN RD
FALCON, CO 80831
TELE: (719) 495-2283
CATHY HANSEN-LEE
EMAIL: CATHY.H@MVEA.COOP

NATURAL GAS
COLORADO SPRINGS UTILITIES (CSU)
7710 DURANT DRIVE, P.O. BOX 1103, MAIL CODE 2150
COLORADO SPRINGS, CO 80947-2150
TELE: (719) 668-5573
AARON CASSIO
EMAIL: ACASSIO@CSU.ORG

FIRE
CIMARRON HILLS FIRE PROTECTION DISTRICT
1835 TUSKEGEE PL
COLORADO SPRINGS, CO 80915
TELE: (719) 591-0960
EMAIL: JMCLEOD@CIMARRON

VICINITY MAP
0 100 200 400
SCALE: 1"=400'

SHEET INDEX

SHEET NUMBER	SHEET TITLE	SHEET DESCRIPTION
1	COVER SHEET	G0.0
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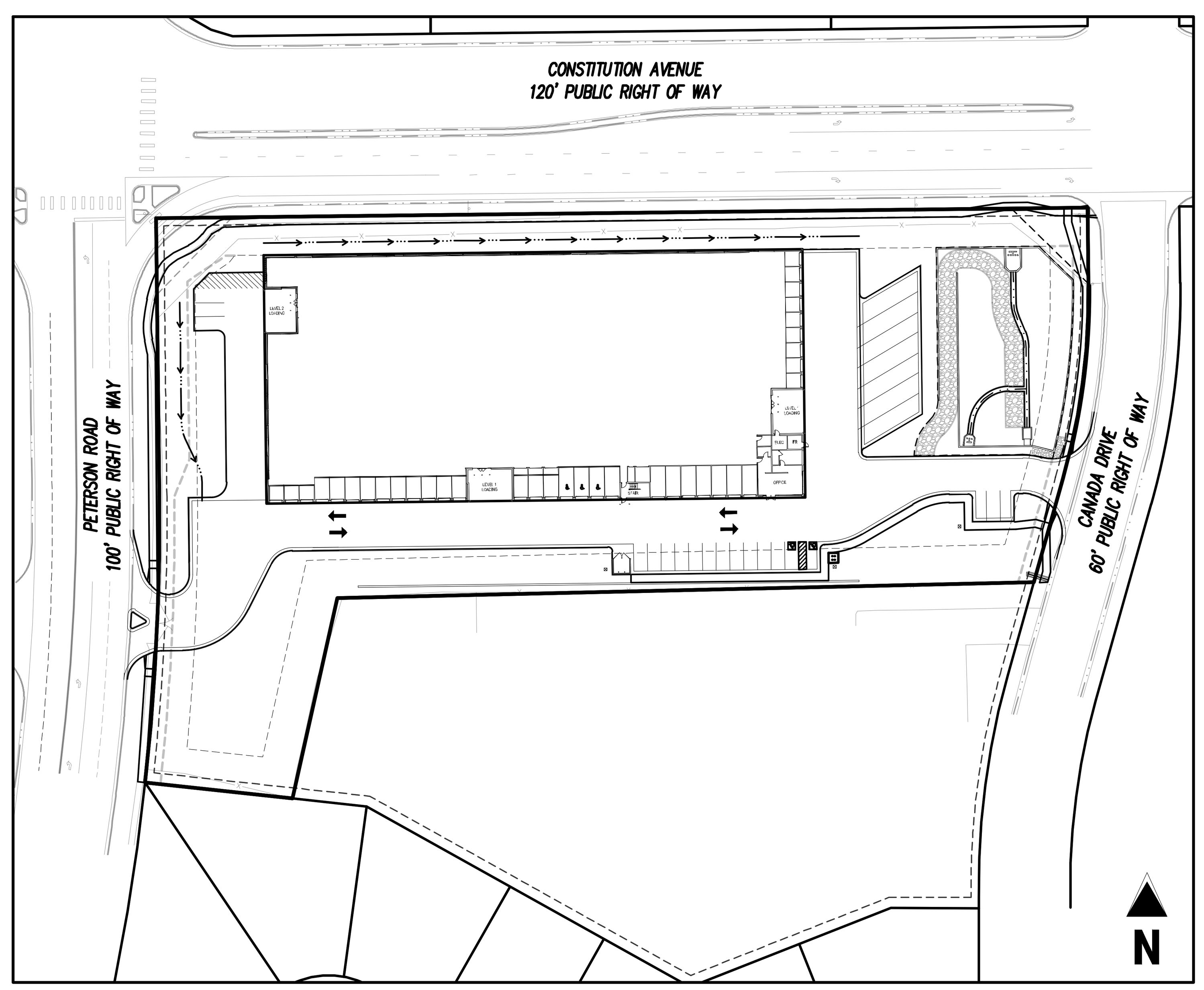
11	GEC DETAILS	G5.5



SITE MAP
0 40 80
SCALE: 1"=80'

LIST OF ABBREVIATIONS

SHT – SHEET
Δ – DEFLECTION ANGLE
L – LENGTH
R – RADIUS
CB – CHORD BEARING
C – CHORD LENGTH
N – NORTH/NORTHING
W – WEST
E – EAST/EASTING
S – SOUTH
DET – DETAIL
EX – EXISTING
W/ – WITH
PC – POINT OF CURVATURE/PORTLAND CEMENT
WWF – WELDED WIRE FABRIC
VERT – VERTICAL
OC – ON CENTER
FDC – FIRE DEPARTMENT CONNECTION
CT – COURT
DR – DRIVE
TYP – TYPICAL
REC – RECEPTION NUMBER
ø, DIA – DIAMETER
PT – POINT OF TANGENCY
MIN – MINIMUM
MAX – MAXIMUM
HDPE – HIGH DENSITY POLYETHYLENE

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 THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY AN NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

RONALD G. DENNIS, COLORADO P.E. NO. 0051622 DATE

OWNER'S STATEMENT

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

BRIAN KEARNEY DATE
JOHNSON DEVELOPMENT ASSOCIATES

EL PASO COUNTY

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 ECM 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 DIRECTORS DISCRETION.

COUNTY ENGINEER / ECM ADMINISTRATOR DATE

PCD FILING NO.

PPR-2224

BASIS OF BEARINGS

BASIS OF BEARING: ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST BEARS N89°20'41"E, MONUMENTED BY THE NORTHWEST CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 4842 1985" IN RANGE BOX, AND BY THE NORTH QUARTER CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 30829 2003", AS SHOWN HEREON.

BENCHMARK

COLORADO SPRINGS UTILITIES FACILITIES INFORMATION MANAGEMENT SYSTEM (FIMS) BENCHMARK SR07 BEING A 2" ALUMINUM CAP STAMPED "CSU FIMS CONTROL SR07" AT THE SOUTHEAST CORNER OF THE CONCRETE BASE FOR AN ELECTRIC VAULT ON THE WEST SIDE OF PETERSON ROAD, ABOUT 360' SOUTH OF THE CENTER LINE OF LEOTI DRIVE.

FIMS DATUM ELEVATION = 6534.61

CAUTION – NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIESTO THE ENGINEER PRIOR TO CONSTRUCTION.

811 Know what's below. Call before you dig.

2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

Galloway
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
303.770.8884
GallowayUS.com

CONSTRUCTION DOCUMENTS
CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

2460 CANADA DRIVE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.
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Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

COVER SHEET

STANDARD NOTES FOR GEC PLANS

1. 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 OFFSITE WATERS, INCLUDING WETLANDS.

2. 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 TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.

3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.

4. ONCE THE ESQCP IS APPROVED AND A "NOTICE TO PROCEED" HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF.

5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.

6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES IS NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN PRIOR TO IMPLEMENTATION.

7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.

8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70 PERCENT OF PRE-DISTURBANCE LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.

9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.

10. 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 WATERS OF THE STATE UNLESS SHOWN TO BE INFEASIBLE AND SPECIFICALLY REQUESTED AND APPROVED.

11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.

12. ANY TEMPORARY OR PERMANENT FACILITY 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.

13. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.

14. DURING DEWATERING OPERATIONS OF UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT SHALL NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF UNLESS AN APPROVED STATE DEWATERING PERMIT IS IN PLACE.

15. EROSION CONTROL BLANKETING OR OTHER PROTECTIVE COVERING SHALL BE USED ON SLOPES STEEPER THAN 3:1.

16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES 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.

17. WASTE 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. CONTROL MEASURES MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.

18. TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFF-SITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.

19. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN ROADS, STORM DRAINS AND OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.

20. 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.

21. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.

22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.

23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR DITCH EXCEPT WITH APPROVED SEDIMENT CONTROL MEASURES.

24. INDIVIDUALS 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 INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.

25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.

26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.

27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.

28. THE SOILS REPORT, TITLED "CIMARRON NORTHCREST NO. 3, COLORADO SPRINGS, COLORADO" FOR THIS SITE HAS BEEN PREPARED BY ROCKY MOUNTAIN GEOTECHNICAL, INC., DATED DECEMBER 28, 1982 AND SHALL BE CONSIDERED A PART OF THESE PLANS.

29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

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

STANDARD NOTES FOR CONSTRUCTION PLANS

1. 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.

2. 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).

3. 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:
   A. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   B. CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   C. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   D. CDOT M & S STANDARDS

4. 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.

5. 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.

6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) - INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.

7. 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.

8. 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.

9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.

10. 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.

11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.

12. 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.

13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]

14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.

15. 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.

EROSION CONTROL NOTES

1. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF THE CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY CONTROL DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

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

2. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN TWENTY-ONE (21) CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPS SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED.

3. CONSTRUCTION FENCE AND SILT FENCE OFFSET FOR CLARITY. CONTRACTOR TO ENSURE BMPS ARE PLACED DOWNSTREAM OF DISTURBED AREAS TO PREVENT SEDIMENT FROM LEAVING THE SITE.

4. BENT GRASS MEADOWS DRIVE SHALL BE STREET SWEPT AND INSPECTED ON A REGULAR BASIS DURING CONSTRUCTION.

5. NO NOTABLE EXISTING VEGETATION EXISTS ON THE SITE, APART FROM NATIVE GRASSES AND WEEDS. THE EXISTING SOIL TYPES WITHIN THE PROPERTY CONSISTS OF COLUMBINE GRAVELLY SANDY LOAM, BLAKELAND-FLUVAQUENTIC HAPLAQUOLLS, AND BLAKELAND LOAMY SAND. ALL SOILS ARE DEFINED AS HAVING A HYDROLOGIC SOIL GROUP OF A, AS DETERMINED BY THE NRCS WEB SOIL SURVEY FOR EL PASO COUNTY AREA.

6. NO BATCH PLANTS TO BE UTILIZED ONSITE.

GENERAL CONSTRUCTION NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.

2. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPLACED AT THE CONTRACTORS EXPENSE AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.

3. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.

4. ALL BACKFILL, SUB-BASE AND / OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED TO THE SOILS ENGINEERS RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION.

5. ALL STATIONING IS CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE INDICATED.

6. ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO THE EPC ECM APPENDIX K - 1.2C.

7. ALL INTERSECTION ACCESSES TO BE CONSTRUCTED WITH A 25 FOOT SIGHT VISIBILITY TRIANGLES AND THERE SHALL BE NO OBSTRUCTIONS GREATER THAN 18" IN THIS AREA.

8. ALL CULVERT AND STORM PIPES SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE (HDPE), OR REINFORCED CONCRETE PIPE (RCP), ALL CULVERTS SHALL BE PLACED COMPLETE WITH FLARED END SECTIONS. ADEQUACY OF MATERIAL THICKNESS FOR ANY CSP INSTALLED SHALL BE VERIFIED BY OWNERS GEOTECHNICAL ENGINEER TO SUPPORT MINIMUM 50 YEAR DESIGN LIFE. CULVERTS MUST CONFORM TO EPC ECM SECTION 3.32 - CULVERTS.

9. ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED FOR ROADS SHALL BE PER DESIGN REPORT BY OWNERS GEOTECHNICAL ENGINEER. OWNERS GEOTECHNICAL ENGINEER TO BE ON SITE AT TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION PRIOR TO CONSTRUCTION.

10. TYPE M RIP-RAP WITH 4" OF TYPE II GRANULAR BEDDING AND MIRAFI 180N OR EQUAL MAY BE SUBSTITUTED WHERE TYPE L RIP-RAP WITH MIRAFI FW 700 OR EQUAL IS SPECIFIED.

11. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN COMPLIANCE WITH ANY AND ALL APPLICABLE EL PASO COUNTY STANDARDS AND WITH WOODMAN HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.

12. ALL POTABLE WATER MAINS SHALL BE AWWA C900-SDR18 PVC WITH PUSH-ON SINGLE GASKET TYPE JOINTS AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.

13. ALL WATER MAIN FITTINGS SHALL BE MADE FROM GRAY-IRON OR DUCTILE IRON AND FURNISHED WITH MECHANICAL JOINT ENDS. ALL FITTINGS SHALL HAVE A PRESSURE RATING OF 250 PSI AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.

14. ALL WATER LINE BENDS, TEES, BLOW-OFFS AND PLUGS AT DEAD-END MAINS SHALL BE PROTECTED FROM THRUST BY USING CONCRETE THRUST BLOCKS AND / OR RODDING AND RESTRAINED PIPE PER THE WOODMEN HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.

15. MAXIMUM DEFLECTION OF 8" OR 12" PVC WATER MAIN JOINTS IS 4 DEGREES. CORRESPONDING MINIMUM CURVE RADIUS IS 286'. ADDITIONAL 11.25° OR 22.5° BENDS MAY BE REQUIRED FOR PROPER ALIGNMENT.

16. CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILED AS-BUILTS OF ALL WATER MAIN, STORM SEWER AND SANITARY SEWER MAIN INSTALLATIONS, INCLUDING ACCURATE DISTANCES OF MAIN LINES, VALVES, FITTINGS, MANHOLES AND LOCATIONS OF WATER AND SEWER SERVICES.

17. SANITARY SEWER PIPE AND FITTINGS: PVC 4" - 8" ASTM D3034, TYPE PSM, SDR 35: PUSH-ON JOINTS AND MOLDED RUBBER GASKETS MAXIMUM HORIZONTAL DEFLECTIONS, AFTER INSTALLATION AND BACK FILLING SHALL NOT EXCEED 3% OF THE PIPE DIAMETER. (MINIMUM CURVE RADIUS IS 100' FOR 8" PVC SANITARY SEWER MAIN)

Galloway
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
303.770.8884
GallowayUS.com

CONSTRUCTION DOCUMENTS
CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

2460 CANADA DRIVE
COLORADO SPRINGS, CO 80915

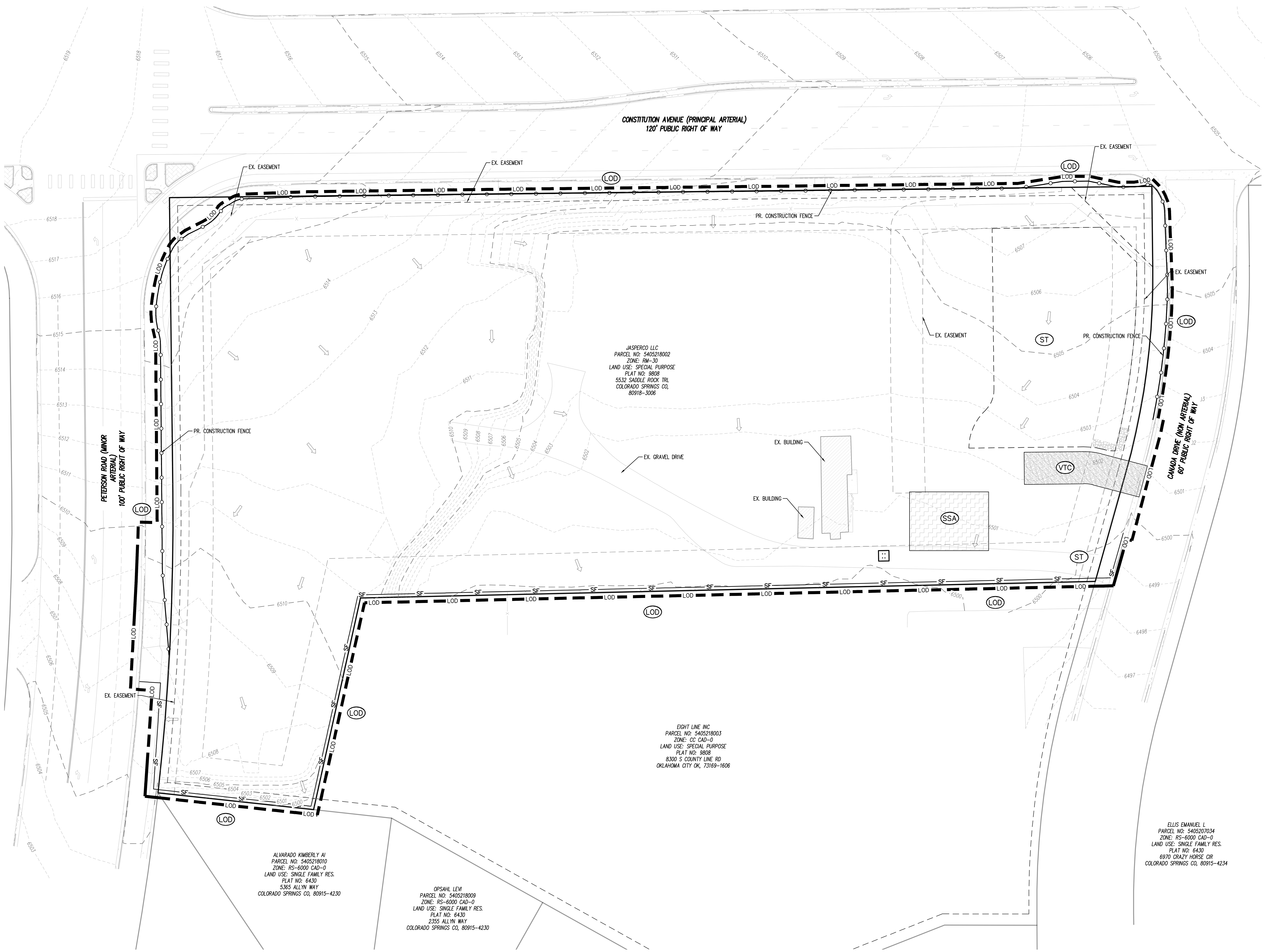
#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GRADING & EROSION CONTROL NOTES

G0.1

Sheet 2 of 11



EROSION CONTROL PHASING SCHEDULE

PHASE	DESCRIPTION
INITIAL	INSTALL VEHICLE TRACKING CONTROL, SILT & CONSTRUCTION FENCE.
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FINAL	CONSTRUCT CURB/GUTTER AND PAVEMENT. CONSTRUCT GAS/ELECTRIC/CABLE/PHONE IN ROW AREAS. REMOVE CONSTRUCTION BMP'S ONCE VERTICAL CONSTRUCTION AND APPLICABLE LANDSCAPING IS COMPLETE.

LEGEND

- EXISTING PROPERTY LINE (PROJECT BOUNDARY)
- EXISTING PROPERTY LINE
- EXISTING CENTER LINE
- PROPOSED CENTER LINE
- EXISTING RIGHT OF WAY LINE
- EXISTING CONCRETE PAVING
- EXISTING GRAVEL ROAD
- PROPOSED CONSTRUCTION FENCE
- EXISTING EASEMENT
- 6940 EXISTING MAJOR CONTOUR
- 6941 EXISTING MINOR CONTOUR
- EXISTING WATER LINE
- SS EXISTING SANITARY SEWER LINE
- EXISTING DRAINAGE FEATURE OUTLINE
- EXISTING SWALE WITH FLOW DIRECTION
- FO EXISTING FIBER OPTIC
- UE EXISTING UNDERGROUND ELECTRIC

EROSION CONTROL LEGEND

- LOD — (LOD) LIMITS OF DISTURBANCE/ CONSTRUCTION SITE BOUNDARY
- SF — (SF) SILT FENCE
- (ST) SEDIMENT TRAP
- (VTC) VEHICLE TRACKING CONTROL
- (SSA) STABILIZED STAGING AREA
- EXISTING FLOW

NOTES

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BENCHMARK

COLORADO SPRINGS UTILITIES FACILITIES INFORMATION MANAGEMENT SYSTEM (FIMS) BENCHMARK SR07 BEING A 2" ALUMINUM CAP STAMPED "CSU FIMS CONTROL SR07" AT THE SOUTHEAST CORNER OF THE CONCRETE BASE FOR AN ELECTRIC VAULT ON THE WEST SIDE OF PETERSON ROAD, ABOUT 360' SOUTH OF THE CENTER LINE OF LEOTI DRIVE.

FIMS DATUM ELEVATION = 6534.61

CAUTION – NOTICE TO CONTRACTOR

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Know what's below. Call before you dig.

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CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

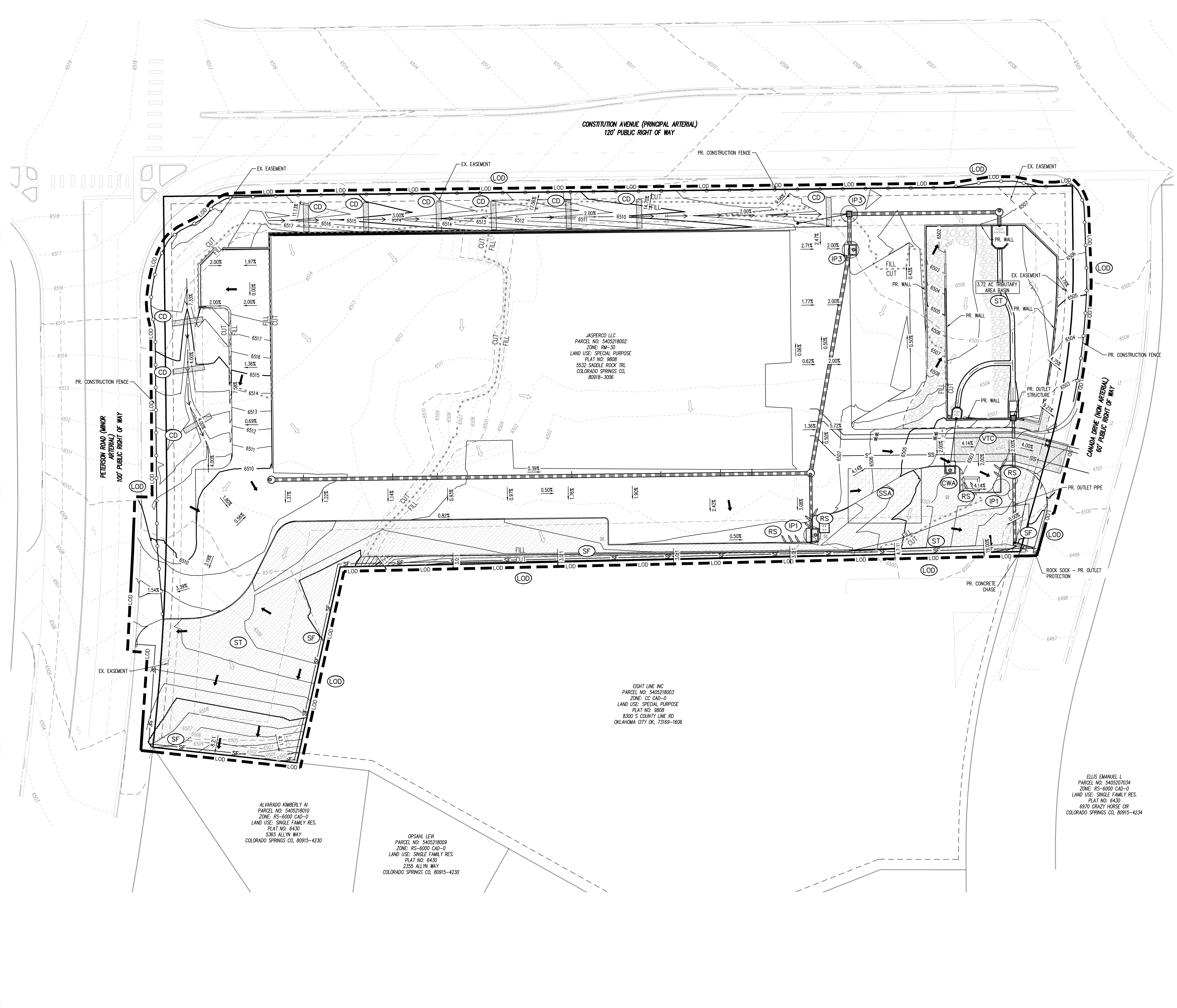
2460 CANADA DRIVE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GRADING & EROSION CONTROL INITIAL PLAN

G1.1



EROSION CONTROL PHASING SCHEDULE

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- FO EXISTING FIBER OPTIC
- UE EXISTING UNDERGROUND ELECTRIC
- SS PROPOSED SANITARY SEWER
- W PROPOSED WATER

EROSION CONTROL LEGEND

- LOD — (LOD) LIMITS OF DISTURBANCE/ CONSTRUCTION SITE BOUNDARY
- SF — (SF) SILT FENCE
- (ST) SEDIMENT TRAP
- (CD) CHECK DAM
- (VTC) VEHICLE TRACKING CONTROL
- (CWA) CONCRETE WASHOUT AREA
- (IP) INLET PROTECTION
- (SSA) STABILIZED STAGING AREA
- (SM) SEED AND MULCH
- (ECB) EROSION CONTROL BLANKET
- (RS) ROCK SOCKS
- EXISTING FLOW
- PROPOSED FLOW

NOTES

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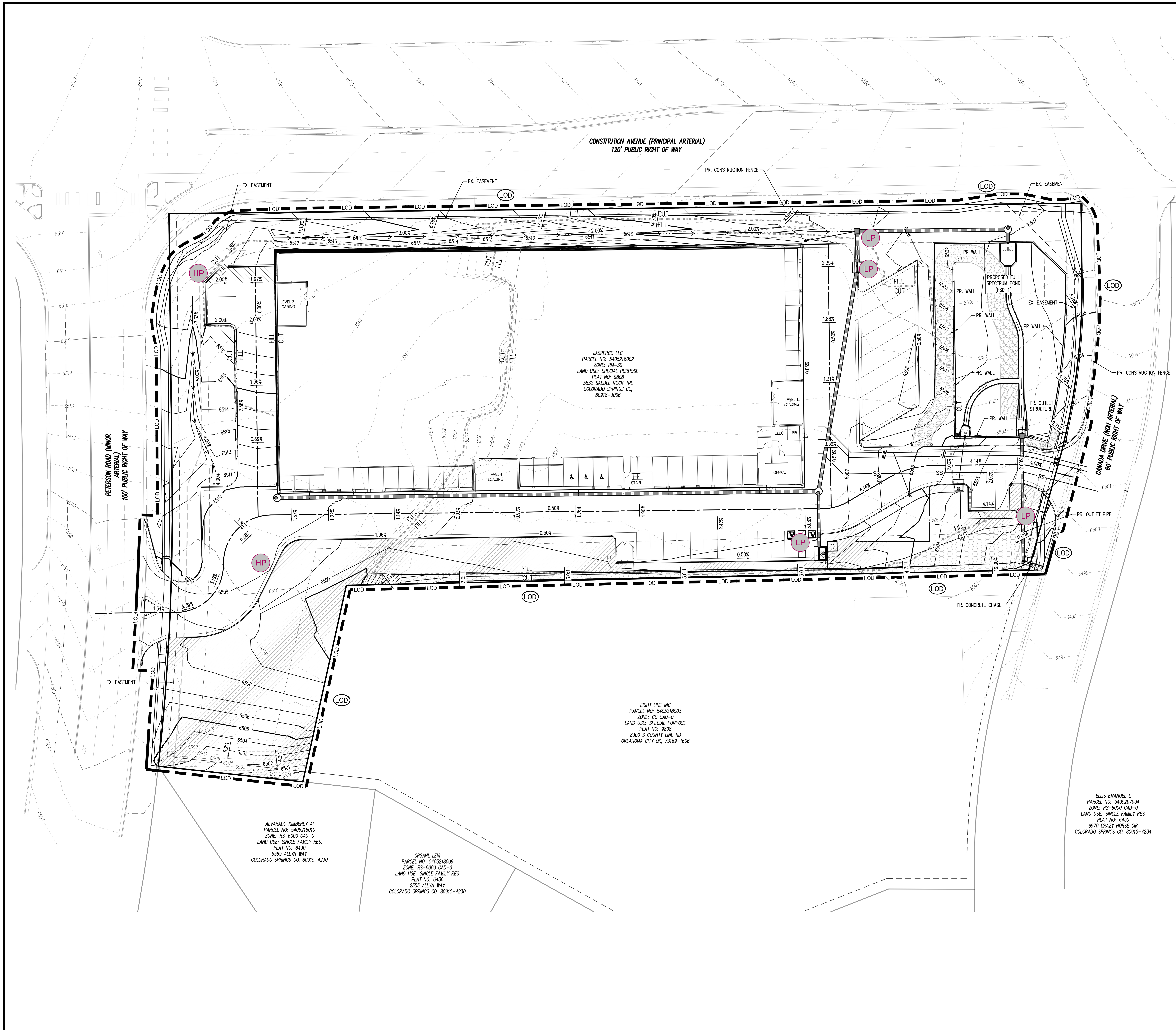
#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GRADING & EROSION CONTROL INTERIM PLAN

G2.1



EROSION CONTROL PHASING SCHEDULE

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- UE EXISTING UNDERGROUND ELECTRIC
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- W PROPOSED WATER

EROSION CONTROL LEGEND

- LOD (LOD) LIMITS OF DISTURBANCE/ CONSTRUCTION SITE BOUNDARY
- (ECB) EROSION CONTROL BLANKET
- (SM) SEED AND MULCH
- (HP) PROPOSED HIGH POINT
- (LP) PROPOSED LOW POINT

NOTES

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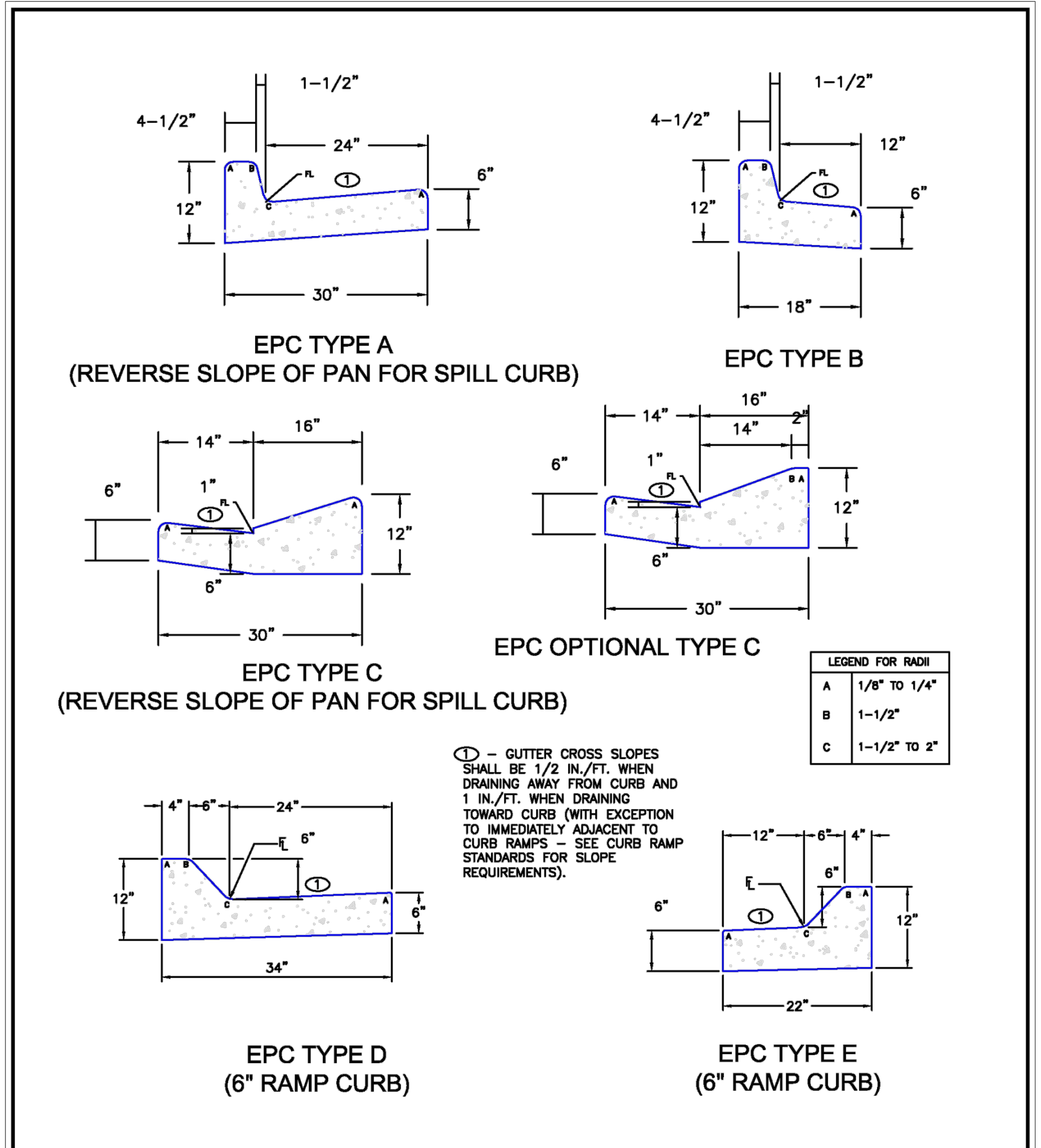
#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

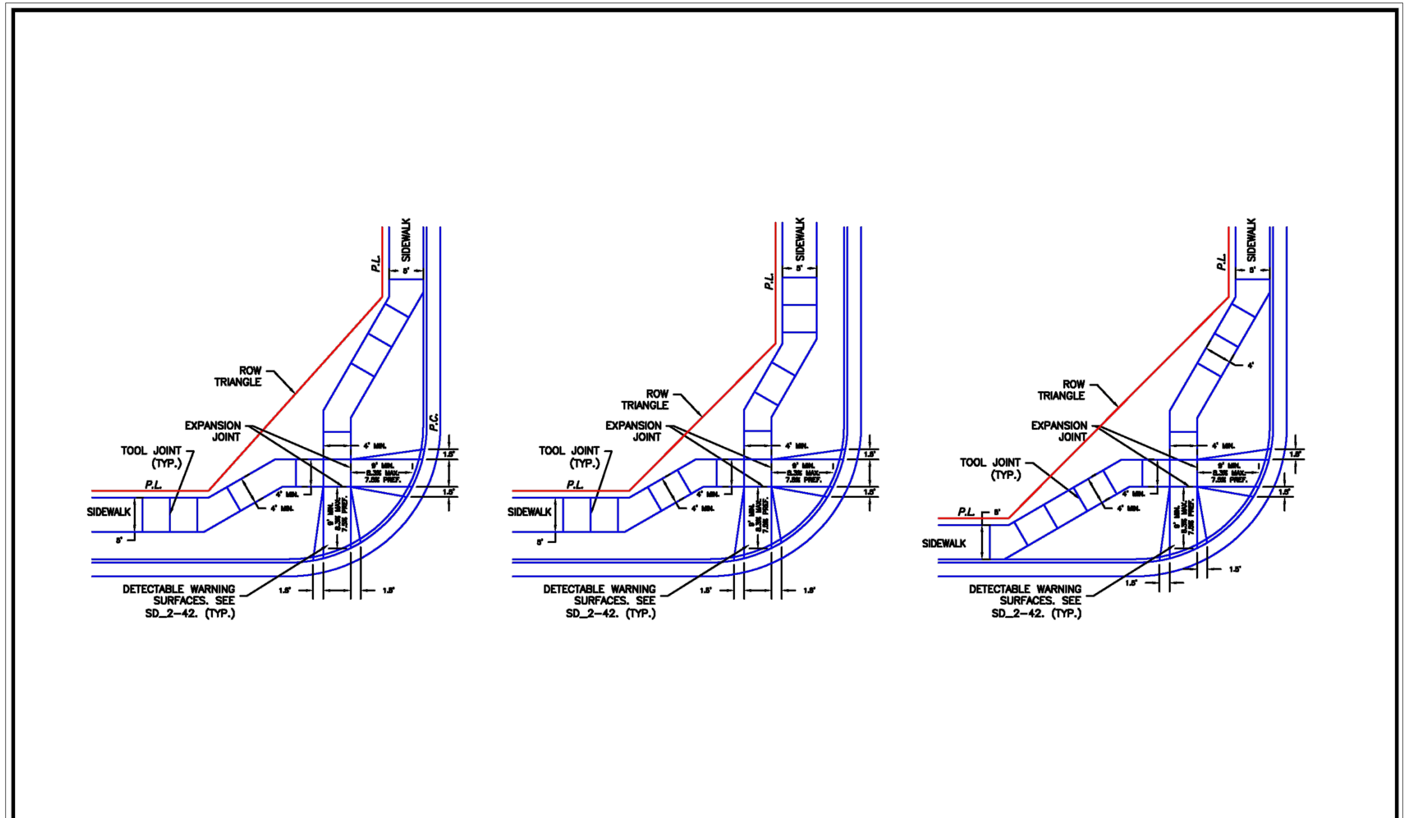
GRADING & EROSION CONTROL FINAL PLAN

G3.1



SCALE: NOT TO SCALE

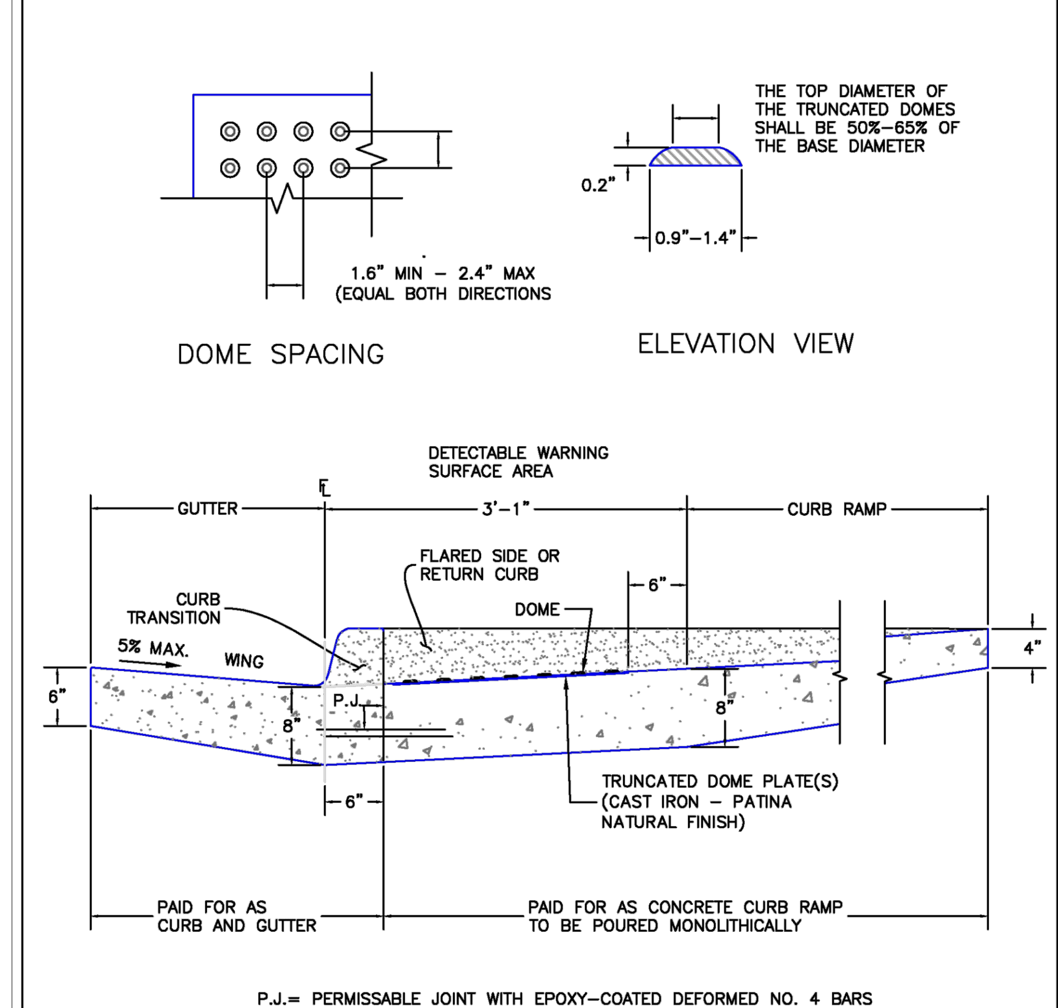
6/23/20 DATE APPROVED: Jennifer E. Irvine DEPARTMENT OF PUBLIC WORKS	Typical Curb and Gutter Details Standard Drawing REVISION DATE: 6/23/20 — FILE NAME: SD_2-20	DEPARTMENT OF PUBLIC WORKS



SCALE: NOT TO SCALE

6/23/20 DATE APPROVED: Jennifer E. Irvine DEPARTMENT OF PUBLIC WORKS	Pedestrian Curb Ramp Detail Standard Drawing REVISION DATE: 6/23/20 — FILE NAME: SD_2-40	DEPARTMENT OF PUBLIC WORKS

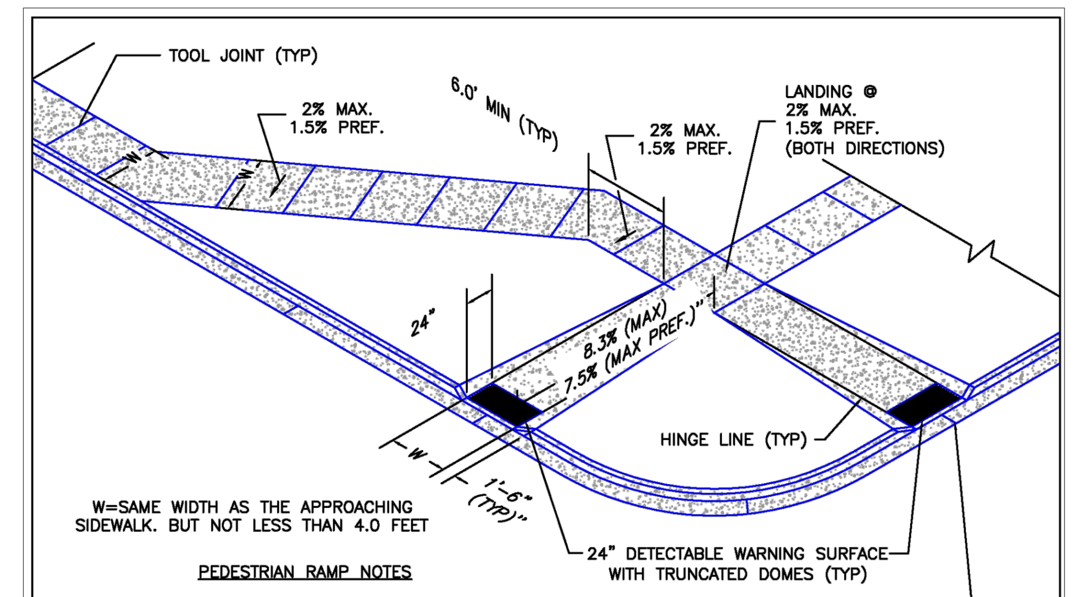
TRUNCATED DOME DETAILS



P.J.= PERMISSABLE JOINT WITH EPOXY-COATED DEFORMED NO. 4 BARS CONFORMING TO AASHTO M 284 AT 18 IN. SPACING

SIDE CROSS SECTION VIEW OF DETECTABLE WARNING SURFACE, CURB AND GUTTER

6/23/20 DATE APPROVED: Jennifer E. Irvine DEPARTMENT OF PUBLIC WORKS	Detectable Warning Surface Details Standard Drawing REVISION DATE: 6/23/20 — FILE NAME: SD_2-42	DEPARTMENT OF PUBLIC WORKS



W=SAME WIDTH AS THE APPROACHING SIDEWALK. BUT NOT LESS THAN 4.0 FEET

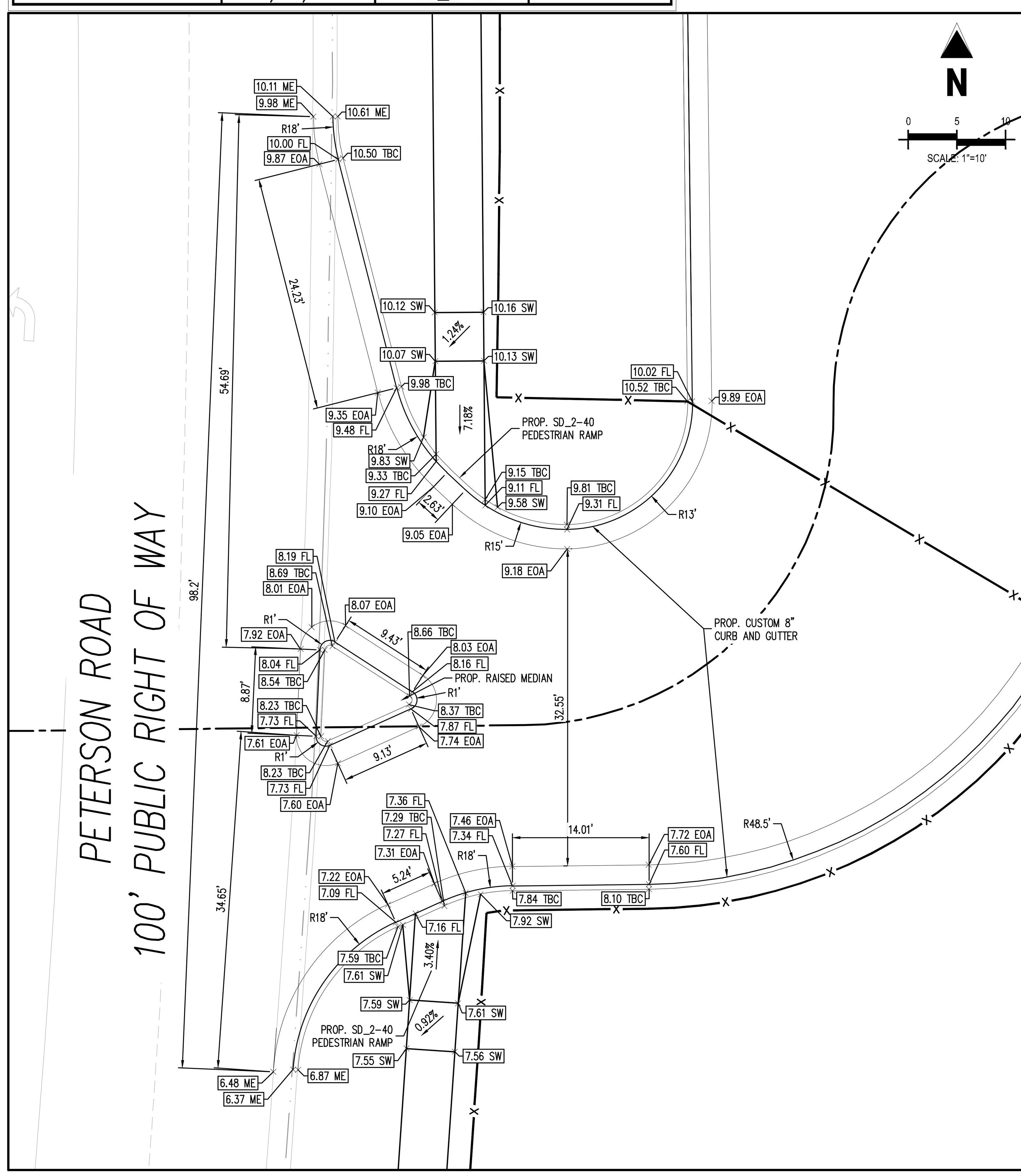
PEDESTRIAN RAMP NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT ENGINEERING CRITERIA MANUAL AND ADA REQUIREMENTS.
2. CONTRACTOR TO NOTIFY ENGINEERING DIVISION INSPECTION STAFF 48 HOURS PRIOR TO CONCRETE PLACEMENT.
3. PEDESTRIAN CURB RAMP CONSTRUCTION SHALL BE A MINIMUM 4,500 PSI CONCRETE, MINIMUM 4" THICK, NON-COLORED, NON-SCORED, COARSE BROOM FINISH.
4. PEDESTRIAN CURB RAMP LOCATION AND LENGTH MAY REQUIRE MODIFICATION TO MAINTAIN THE 8.3% MAXIMUM RUNNING RAMP SLOPE DUE TO STREET INTERSECTION GRADES AND/OR ALIGNMENTS. SEE ECM SECTION 6.3.6 FOR PEDESTRIAN PUSHBUTTON LOCATION REQUIREMENTS.
5. DETECTABLE WARNING SURFACE SHALL START A MINIMUM OF 6" BUT NOT MORE THAN 8" FROM THE FLOWLINE OF THE CURB AT ANY POINT.
6. DETECTABLE WARNING SURFACE SHALL BE PREFABRICATED, CAST IRON (PATINA NATURAL FINISH) AND IN ACCORDANCE WITH ECM CHAPTER 6 AND SD_2-42. THERMOPLASTIC TRUNCATED DOMES AND PAVERS WILL NOT BE ACCEPTED.
7. THE DETECTABLE WARNING SURFACE SHALL BE 24" IN LENGTH AND THE FULL WIDTH OF THE RAMP.
8. PEDESTRIAN CURB RAMP WIDTH REQUIRED IS SAME AS APPROACHING SIDEWALK; 4' MINIMUM.
9. ALL PEDESTRIAN CURB RAMPS WILL BE PERPENDICULAR TO TRAFFIC WITH THE EXCEPTION OF MID-BLOCK OR TERMINAL RAMPS WHICH MAY BE PARALLEL SUBJECT TO APPROVAL.
10. DRAINAGE STRUCTURES, TRAFFIC SIGNAL/SIGNAGE, UTILITIES/JUNCTION BOXES, OR OTHER OBSTRUCTIONS WITHIN PROPOSED PEDESTRIAN CURB RAMP AREAS AND LANDINGS ARE PROHIBITED.
11. THE COUNTER SLOPE OF THE GUTTER OR ROAD AT THE FOOT OF A RAMP SHALL NOT EXCEED 5%.

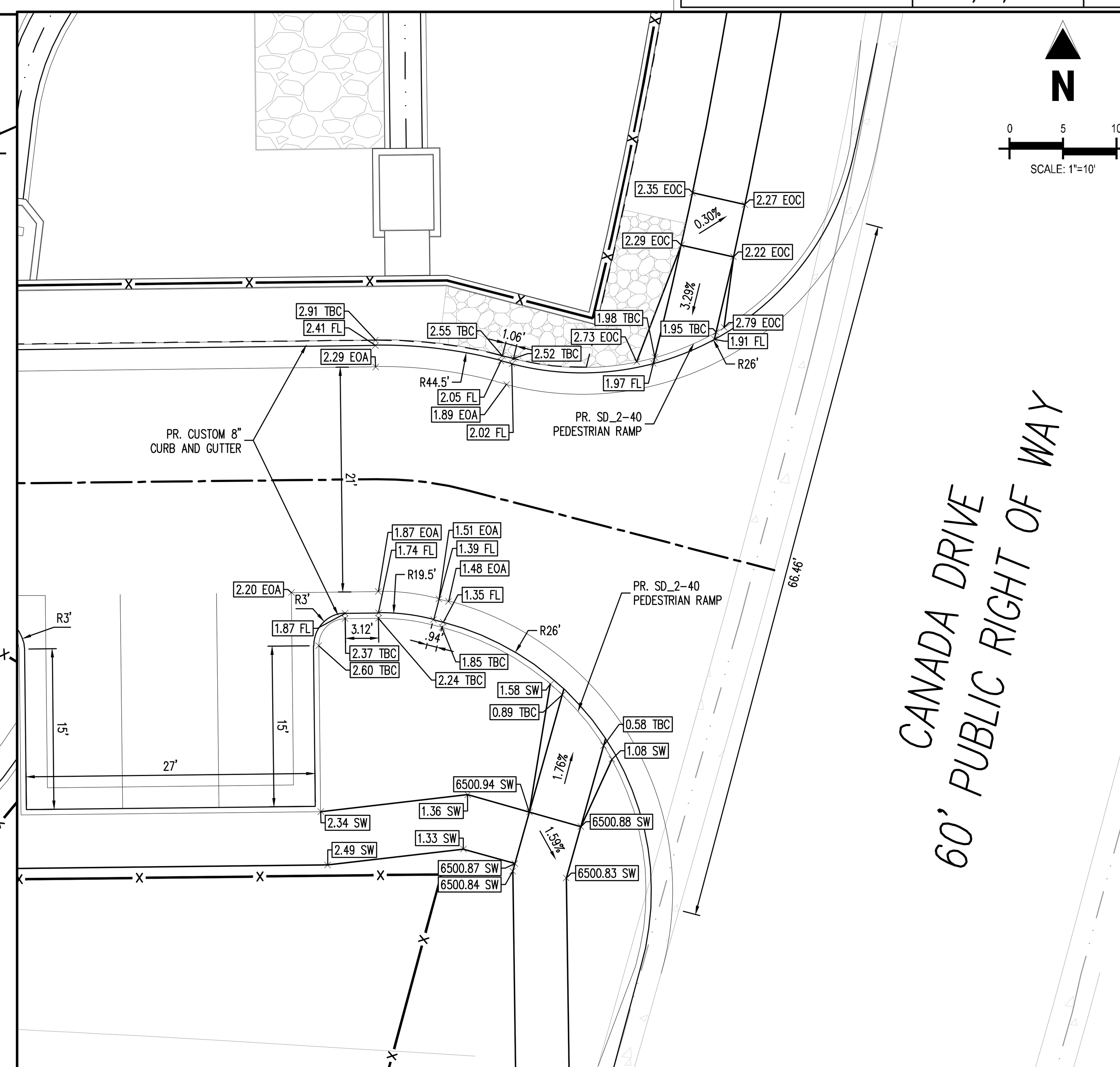
GENERAL NOTES

1. WHERE THE 1'-6" FLARED SIDE(S) OF A PERPENDICULAR CURB RAMP IS (ARE) CONTIGUOUS WITH A PEDESTRIAN OR HARD SURFACE AREA (PEDESTRIAN CIRCULATION PATH), THE MAXIMUM FLARE SLOPE SHALL NOT EXCEED 10:1.
2. PEDESTRIAN WALKWAY (PEDESTRIAN ACCESS ROUTE) AND/OR LOCATION OF EXISTING OR FUTURE PEDESTRIAN RAMPS ON OPPOSITE CORNERS SHALL BE REVIEWED BEFORE CONSTRUCTING NEW RAMPS.
3. AT MARKED PEDESTRIAN CROSSINGS, THE BOTTOM OF THE RAMPS, EXCLUSIVE OF THE FLARE SIDES, SHALL BE TOTALLY CONTAINED WITHIN THE MARKINGS.

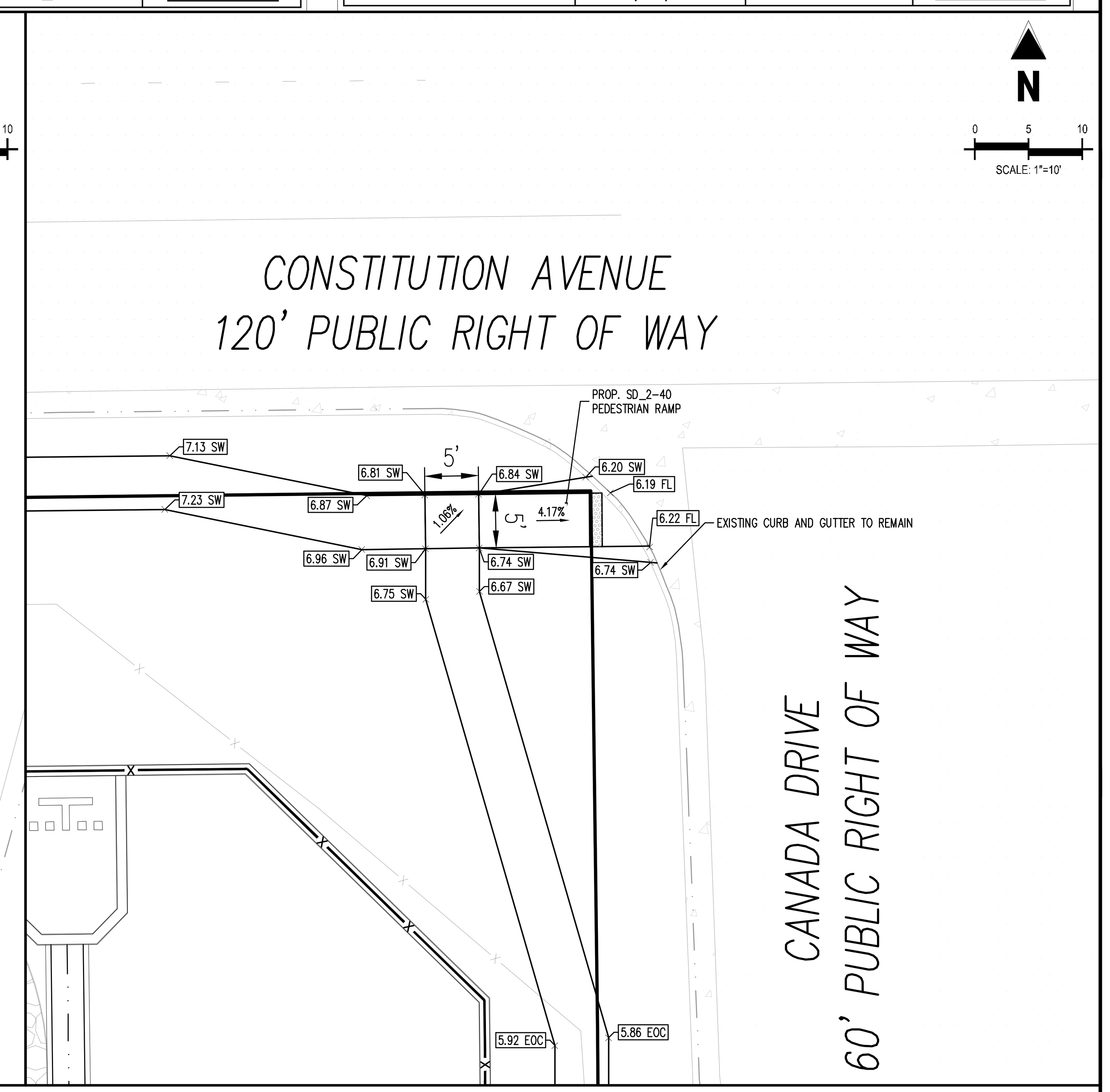
6/23/20 DATE APPROVED: Jennifer E. Irvine DEPARTMENT OF PUBLIC WORKS	Pedestrian Curb Ramp Detail Standard Drawing REVISION DATE: 6/23/20 — FILE NAME: SD_2-41	DEPARTMENT OF PUBLIC WORKS



WEST DRIVEWAY DETAIL
SCALE: 1" = 10'



EAST DRIVEWAY DETAIL
SCALE: 1" = 10'



NORTH EAST PEDESTRIAN RAMP DETAIL
SCALE: 1" = 10'

PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR:

COUNTY FILE NUMBER:
PPR-2224

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

SITE DEVELOPMENT PLAN
CONSTITUTION STORAGE
JOHNSON DEVELOPMENT ASSOCIATES
6855 CONSTITUTION AVENUE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	RWO
Checked By:	RGD
Date:	DECEMBER 2022

INTERSECTION DETAILS

G4.1
Sheet 6 of 14

Construction Details and Maintenance Requirements

Figure VT-1 and VT-2 provide construction details and maintenance requirements for vehicle tracking.

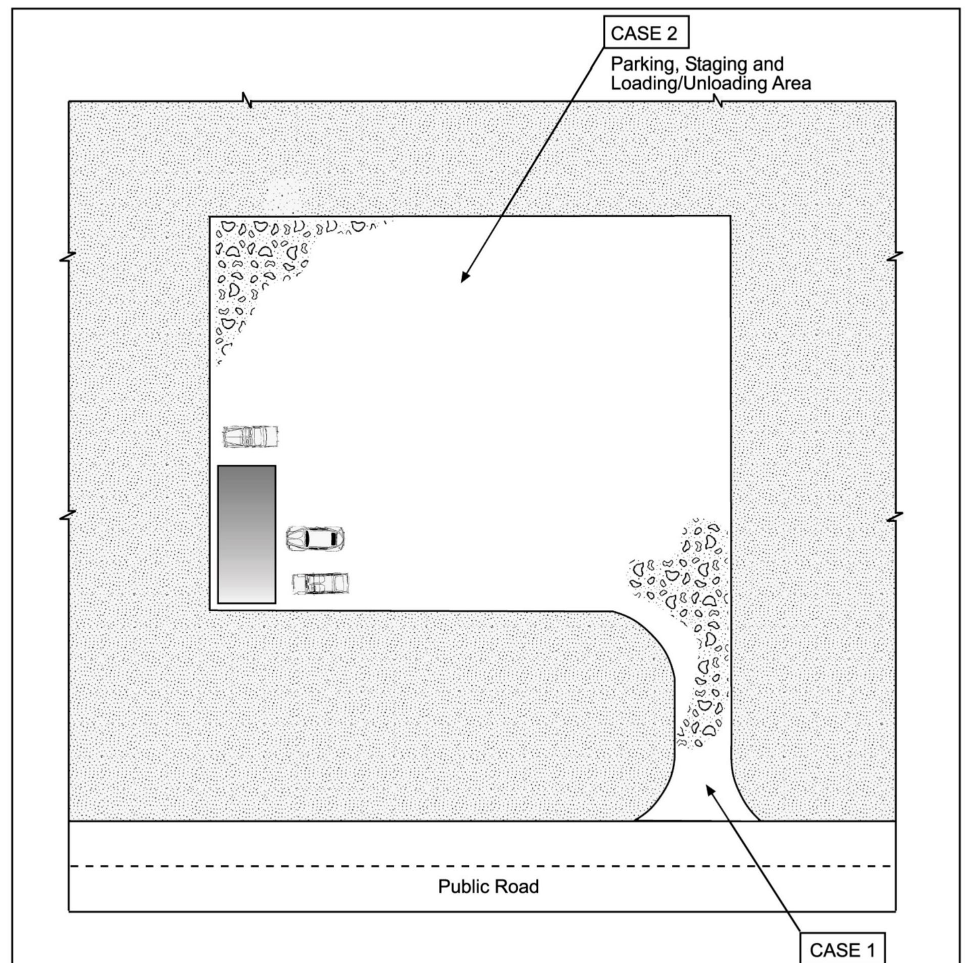


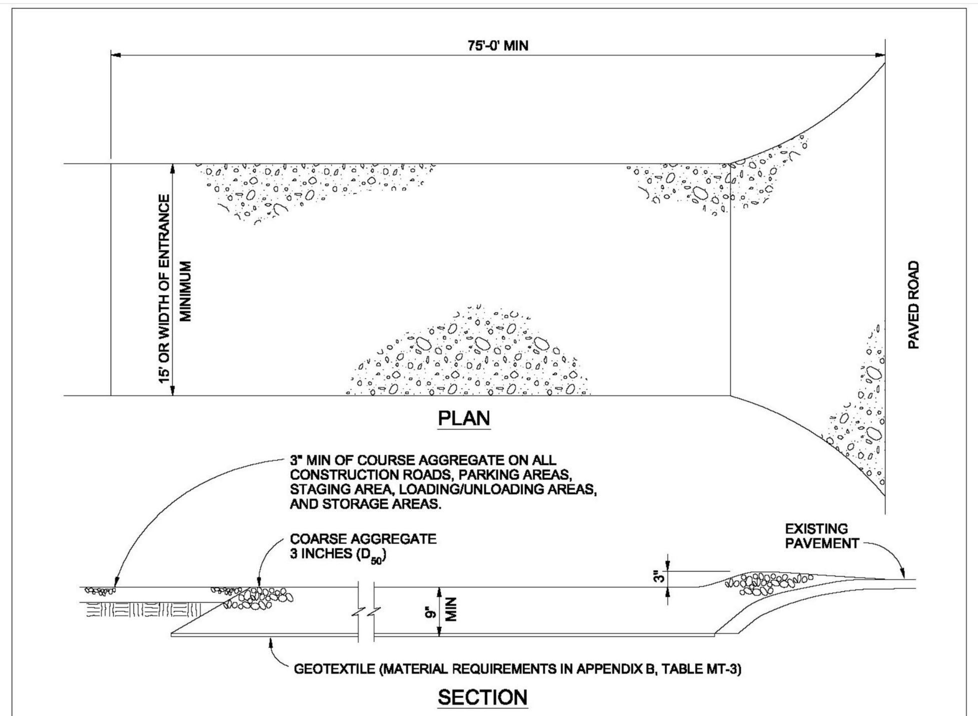
Table VT-1

	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

DEN/M153722.CS.DS/FigVT-1/9-99

El Paso County, CO Drainage Criteria Manual about:blank



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.

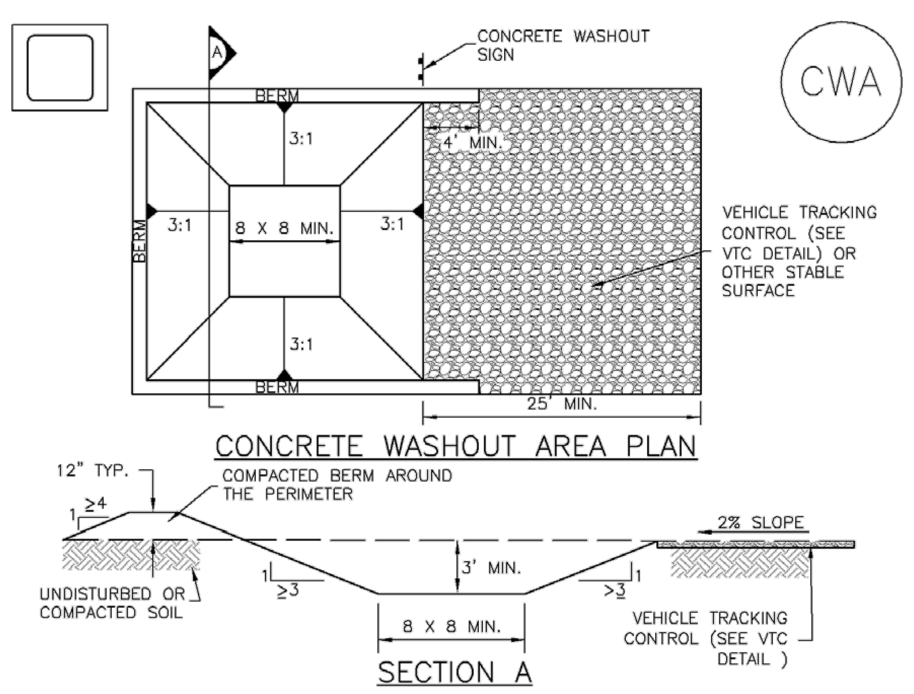
3. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED DAILY BY SHOVELING OR SWEEPING. SEDIMENT IS NOT TO BE WASHED DOWN STORM SEWER DRAINS.

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

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.

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.

T-2 Grass Swale

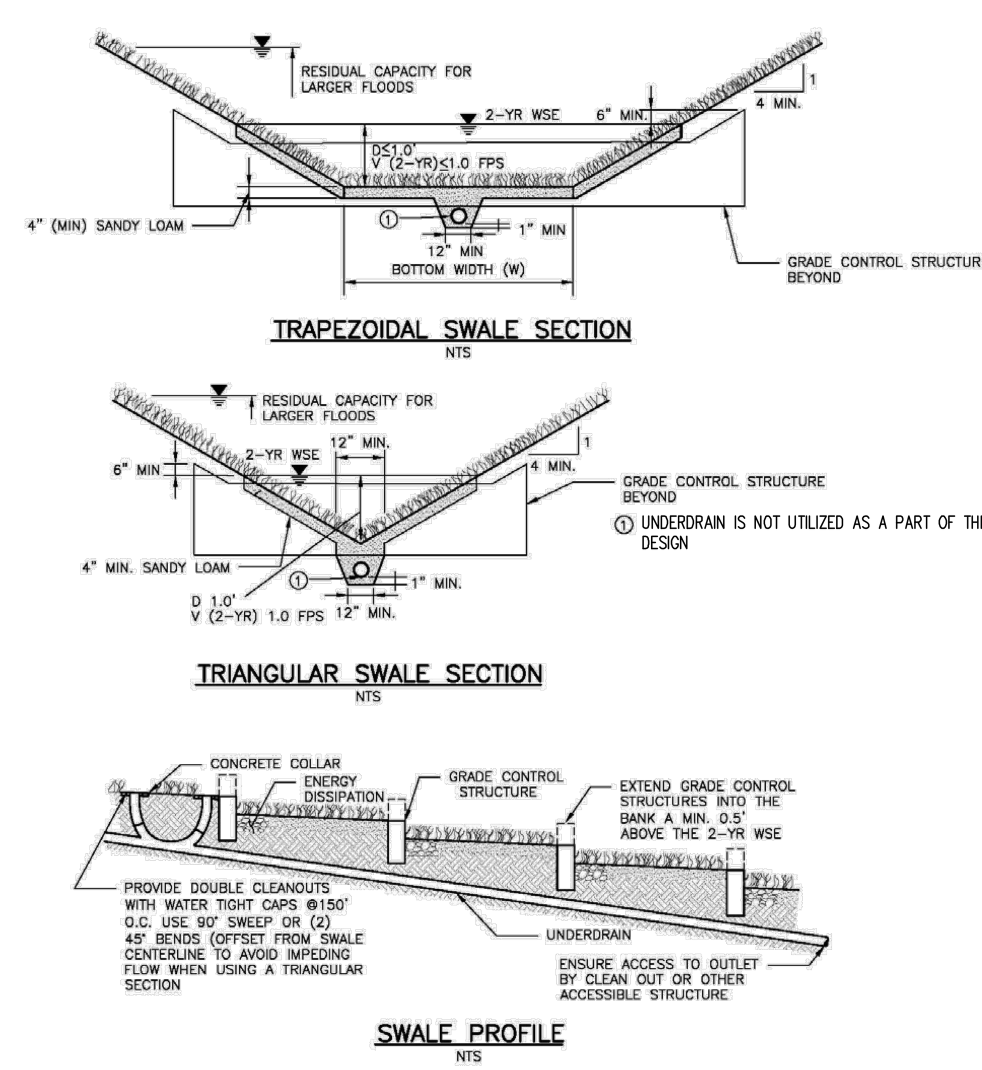


Figure GS-1. Grass Swale Profile and Sections

Design Example

The *UD-BMP* workbook, designed as a tool for both designer and reviewing agency is available at www.udfcd.org. This section provides a completed design form from this workbook as an example.

Galloway
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
303.770.8884
GallowayUS.com

CONSTRUCTION DOCUMENTS
CONSTITUTION STORAGE
JOHNSON DEVELOPMENT ASSOCIATES
2460 CANADA DRIVE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GEC DETAILS

G5.1
Sheet 7 of 11

Sediment Trap (ST) SC-8

SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.

2. ONLY USE FOR DRAINAGE AREAS LESS THAN 1 ACRE.

3. SEDIMENT TRAPS SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND–DISTURBING ACTIVITIES.

4. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

5. SEDIMENT TRAP OUTLET TO BE CONSTRUCTED OF RIPRAP, TYPE M (D50=12") TYP.SMALLER ROCK SIZE MAY BE ALLOWABLE FOR SMALLER TRAPS IF APPROVED BY LOCAL JURISDICTION.

6. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.

7. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE A MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP 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. REMOVE SEDIMENT ACCUMULATED IN TRAP AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN THE SEDIMENT DEPTH REACHES ½ THE HEIGHT OF THE RIPRAP OUTLET.

5. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT TRAPS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, 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.

EC-12 Check Dams (CD)

CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATION OF CHECK DAMS.
   - –CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - –LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.

3. RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").

4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.

5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1' 6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM 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 CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN ½ OF THE HEIGHT OF THE CREST.

5. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

6. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, 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.

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.

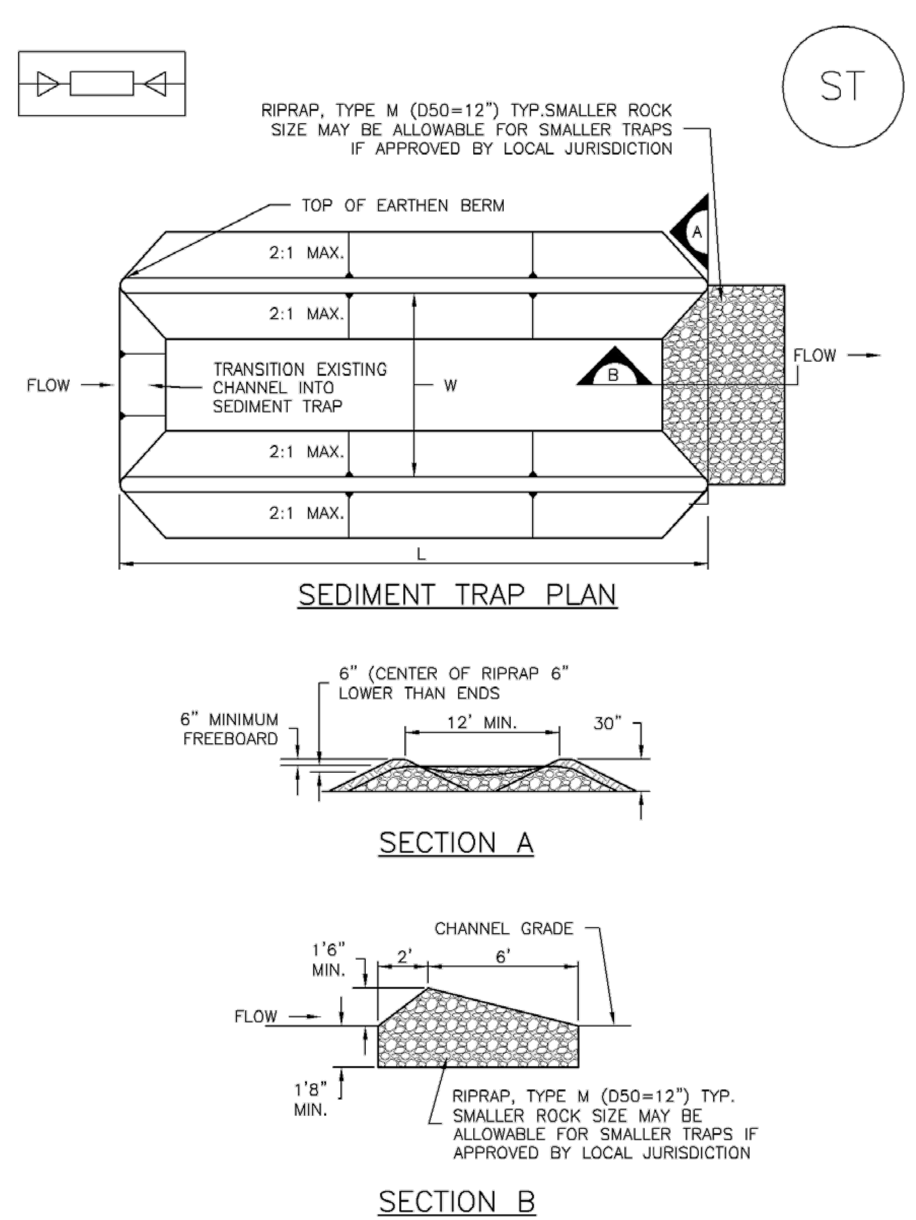
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

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)

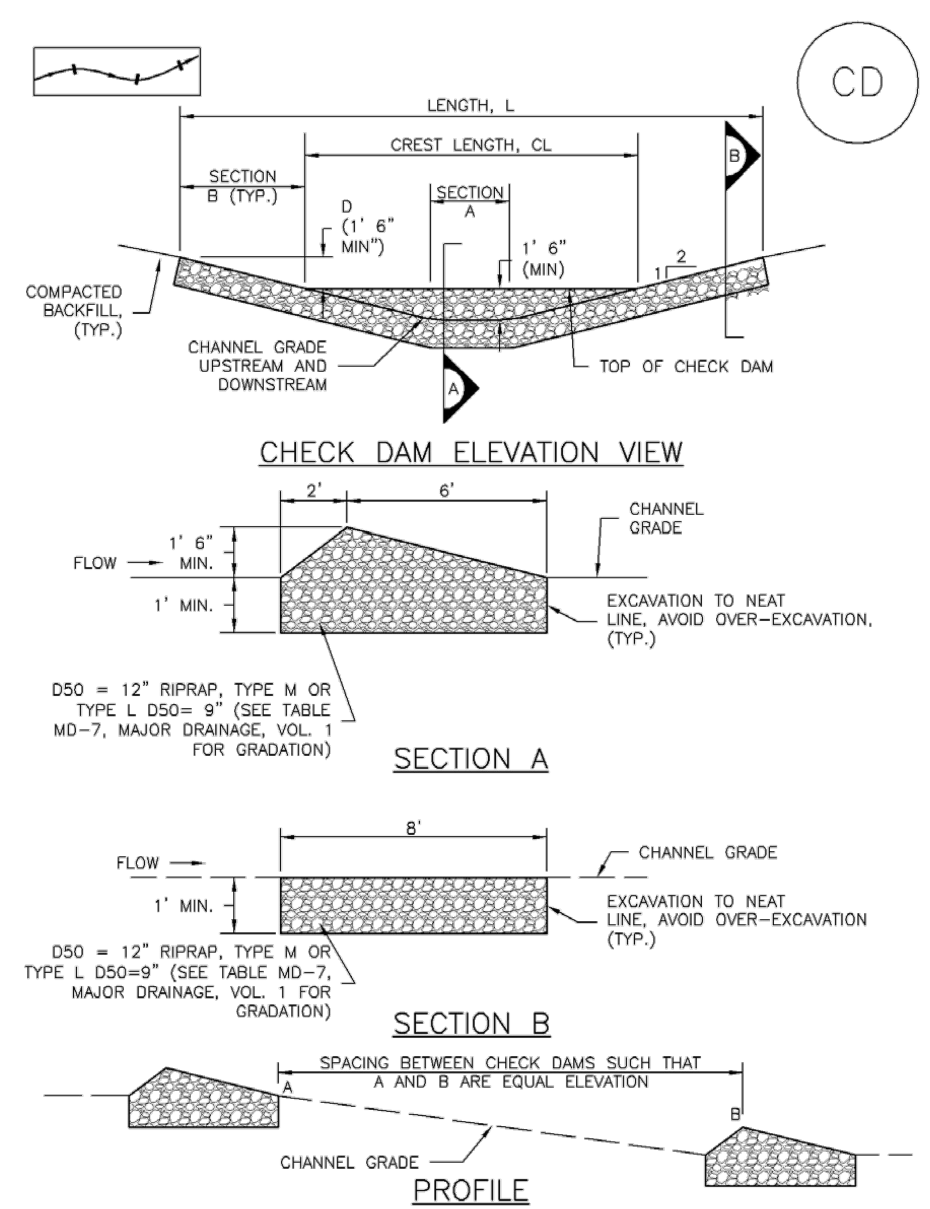
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

SC-8 Sediment Trap (ST)



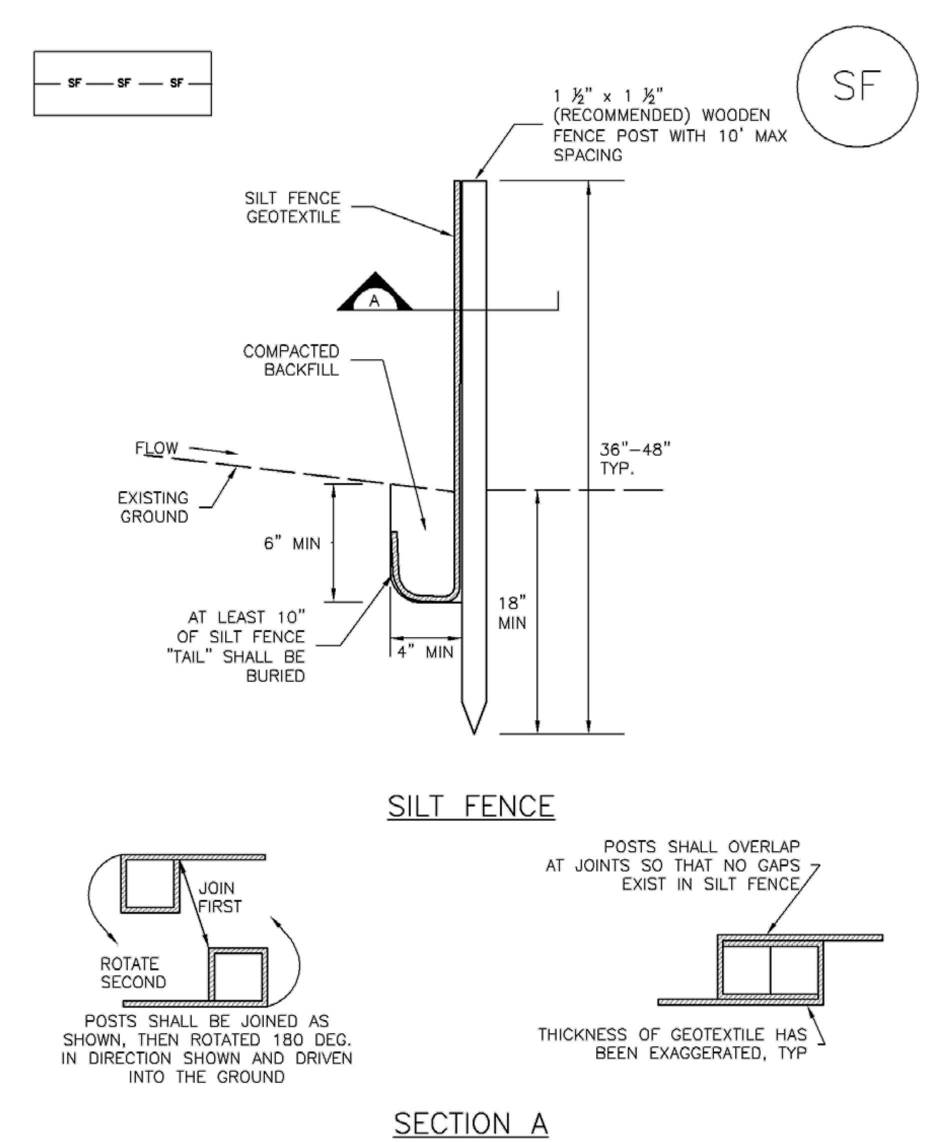
ST–1. SEDIMENT TRAP

Check Dams (CD) EC-12



CD–1. CHECK DAM

Silt Fence (SF) SC-1



SF–1. SILT FENCE

Galloway
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
303.770.8884
GallowayUS.com

CONSTRUCTION DOCUMENTS
CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

2460 CANADA DRIVE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GEC DETAILS

G5.2

Construction Fence (CF) — SM-3

CONSTRUCTION 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. CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS RIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

5. WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

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.

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

Rock Sock (RS) — SC-5

ROCK SOCK 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 SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE 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, 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 ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; 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.

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.

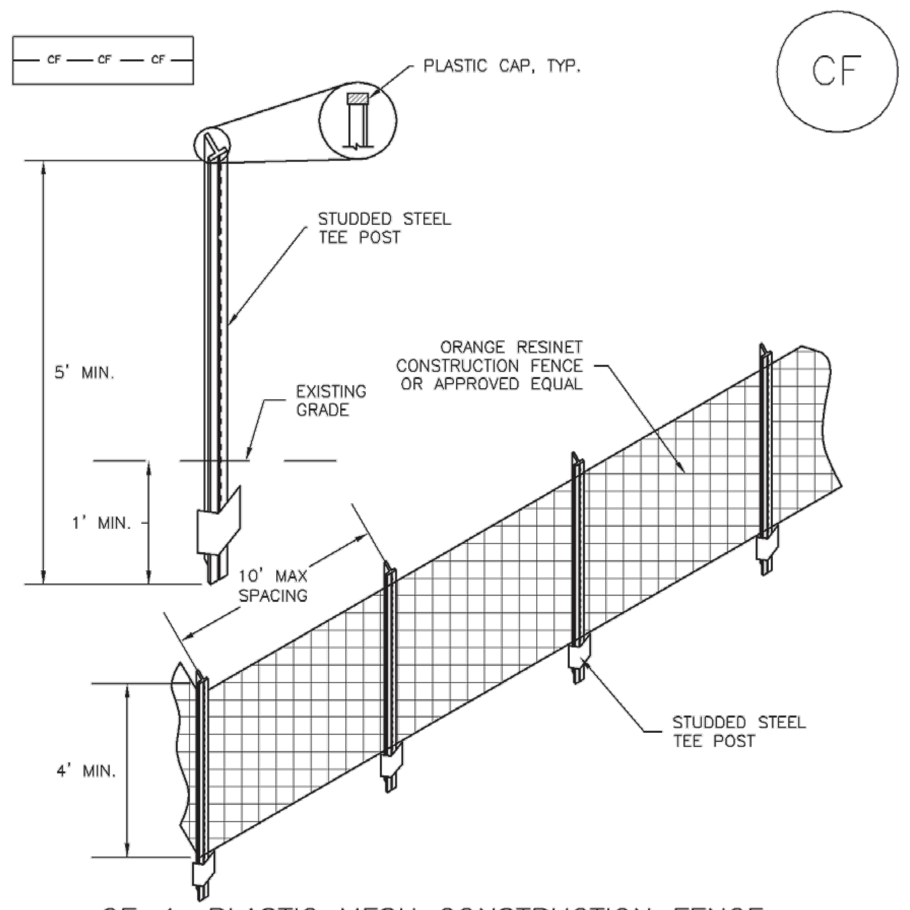
6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

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 UDFCD 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)

SM-3 — Construction Fence (CF)



CF-1. PLASTIC MESH CONSTRUCTION FENCE

CONSTRUCTION FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF CONSTRUCTION FENCE.

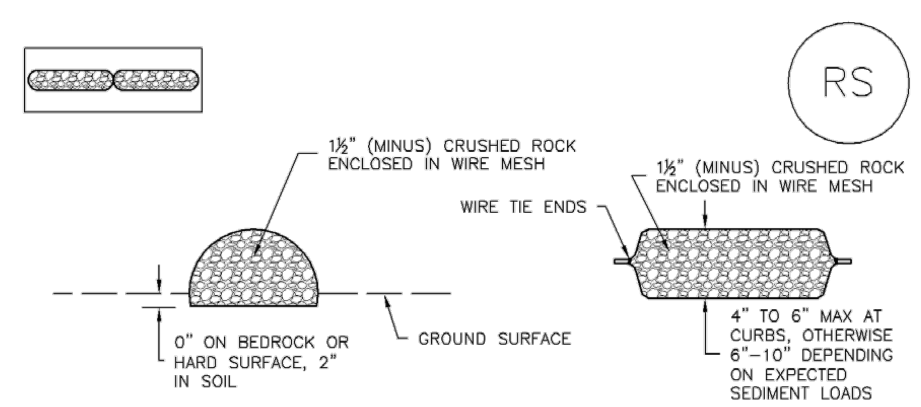
2. CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

3. CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR-GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.

4. STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.

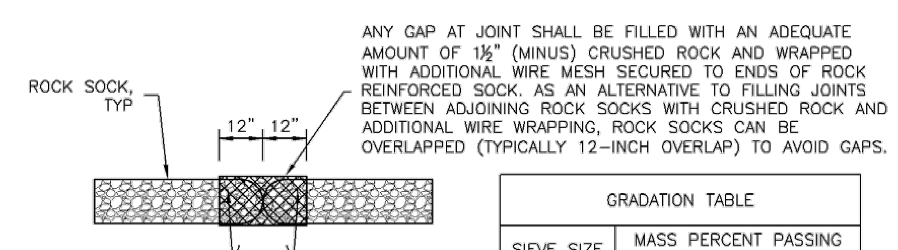
5. CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

SC-5 — Rock Sock (RS)



ROCK SOCK SECTION

ROCK SOCK PLAN



ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 - 100
1"	20 - 55
¾"	0 - 15
⅜"	0 - 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).

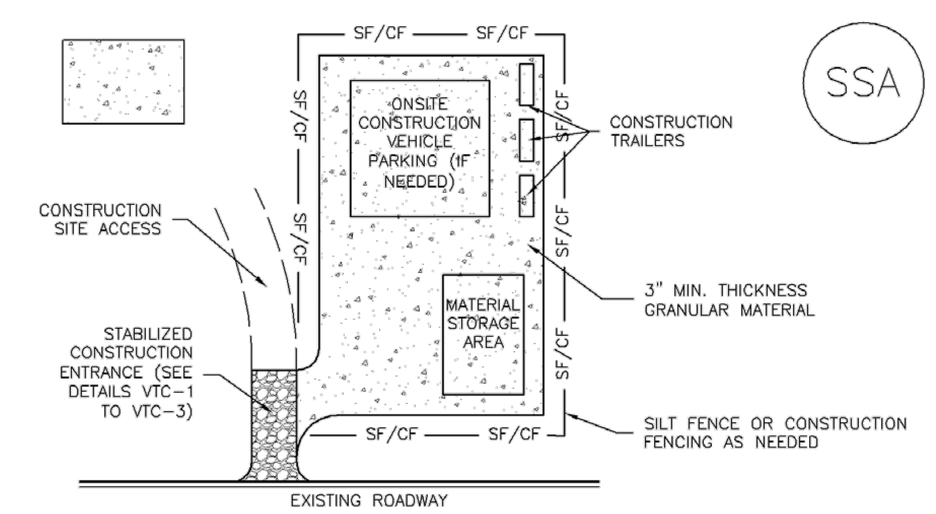
3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"

4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS-1. ROCK SOCK PERIMETER CONTROL

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.

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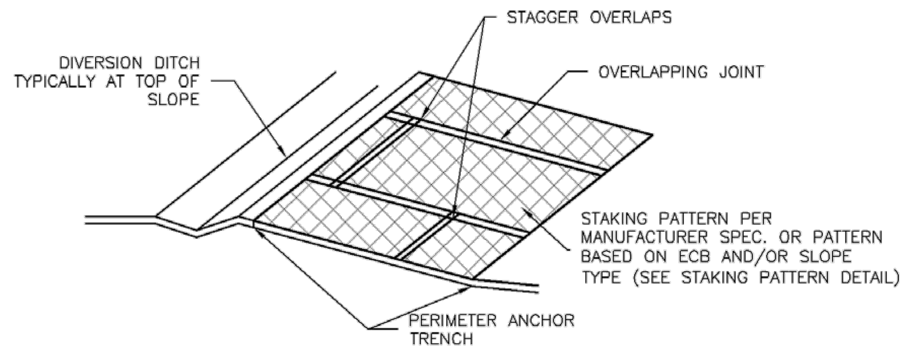
#	Date	Issue / Description	Init.

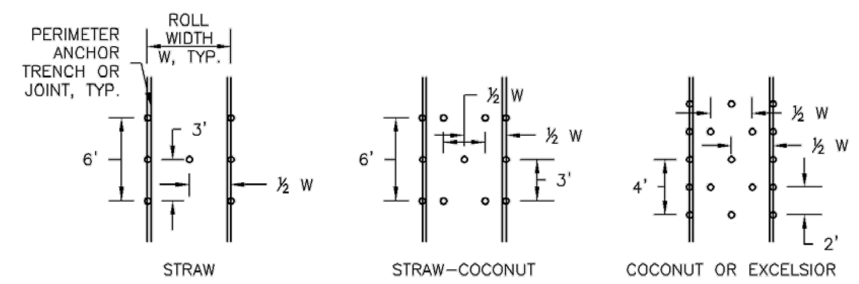
Project No: JDA02
Drawn By: BLB
Checked By: RGD
Date: DECEMBER 2022

GEC DETAILS

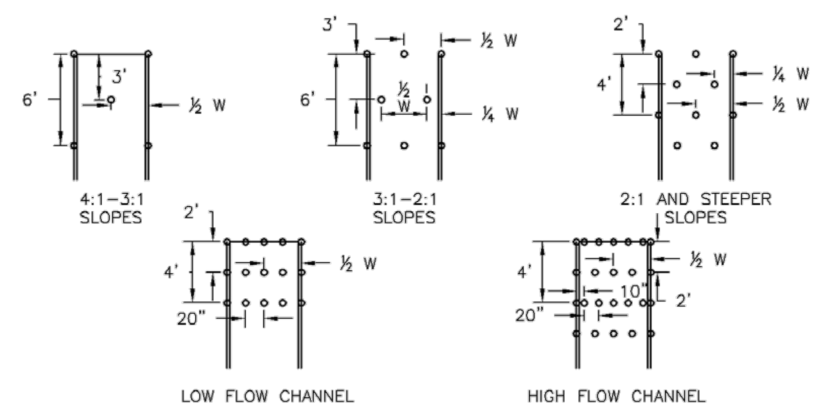
G5.3
Sheet 9 of 11



ECB–3. OUTSIDE OF DRAINAGEWAY



STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF ECB.
   –TYPE OF ECB (STRAW, STRAW–COCONUT, COCONUT, OR EXCELSIOR).
   –AREA, A, IN SQUARE YARDS OF EACH TYPE OF ECB.

2. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE PREFERRED FOR RECPs, ALTHOUGH SOME JURISDICTIONS MAY ALLOW OTHER MATERIALS IN SOME APPLICATIONS.

3. IN AREAS WHERE ECBs ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO ECB INSTALLATION AND THE ECB SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.

4. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.

5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL ECBs EXCEPT STRAW WHICH MAY USE AN OVERLAPPING JOINT.

6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE–HALF ROLL LENGTH FOR COCONUT AND EXCELSIOR ECBs.

7. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER FOR ECBs ON SLOPES.

8. MATERIAL SPECIFICATIONS OF ECBs SHALL CONFORM TO TABLE ECB–1.

9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING ECBS SHALL BE RESEEDED AND MULCHED.

10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM THOSE SHOWN HERE.

TABLE ECB–1. ECB MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING**
STRAW*	–	100%	–	DOUBLE/ NATURAL
STRAW–COCONUT	30% MIN	70% MAX	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

*STRAW ECBs MAY ONLY BE USED OUTSIDE OF STREAMS AND DRAINAGE CHANNEL.
**ALTERNATE NETTING MAY BE ACCEPTABLE IN SOME JURISDICTIONS

EROSION CONTROL BLANKET 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.

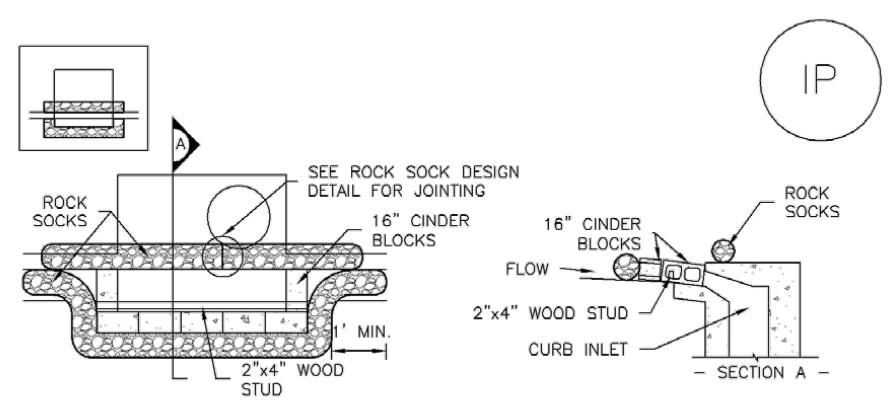
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ECBs SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE, UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.

5. ANY ECB PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW THE GEOTEXTILE THAT HAVE ERODED TO CREATED A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE ECB REINSTALLED.

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.

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



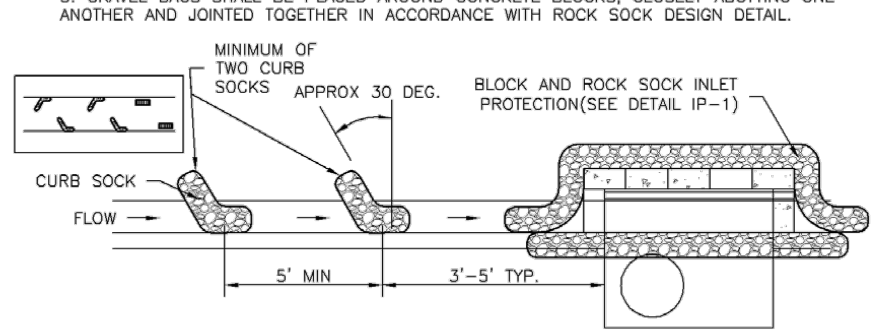
IP–1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.

3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP–2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

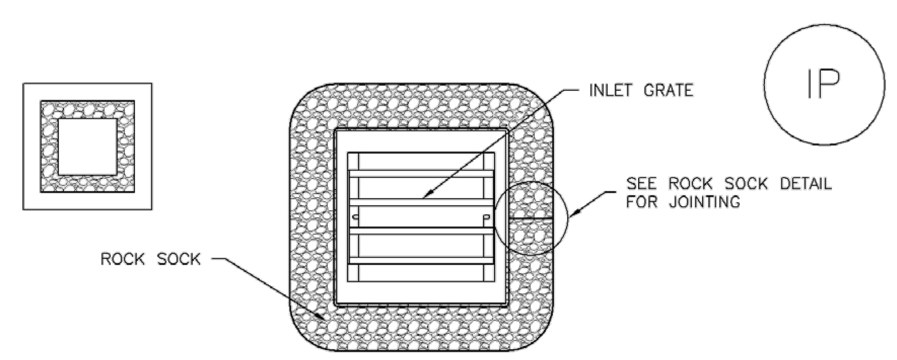
CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.

2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.

3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.

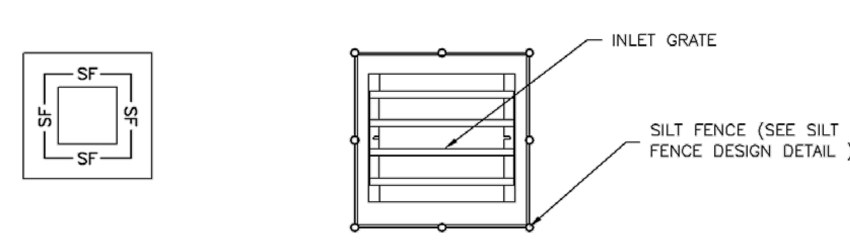
4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON–GRADE INLETS.



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.

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 ¼ 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.

Galloway
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
303.770.8884
GallowayUS.com

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2460 CANADA DRIVE
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#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GEC DETAILS

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Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5–10	½ - ¾
7. Sorghum	Warm	5–10	½ - ¾
8. Winter wheat	Cool	20–35	1 - 2
9. Winter barley	Cool	20–35	1 - 2
10. Winter rye	Cool	20–35	1 - 2
11. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common[a] Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Alakali Soil Seed Mix					
Alkali sacaton	*Sporobolus airoides*	Cool	Bunch	1,750,000	0.25
Basin wildrye	*Elymus cinereus*	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Jose tall wheatgrass	*Agropyron elongatum 'Jose'*	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.75**
Fertile Loamy Soil Seed Mix					
Ephriam crested wheatgrass	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	2.0
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	7.0
Total					**15.5**
High Water Table Soil Seed Mix					
Meadow foxtail	*Alopecurus pratensis*	Cool	Sod	900,000	0.5
Redtop	*Agrostis alba*	Warm	Open sod	5,000,000	0.25
Reed canarygrass	*Phalaris arundinacea*	Cool	Sod	68,000	0.5
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Pathfinder switchgrass	*Panicum virgatum 'Pathfinder'*	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	*Agropyron elongatum 'Alkar'*	Cool	Bunch	79,000	5.5
Total					**10.75**
Transition Turf Seed Mix[c]					
Ruebens Canadian bluegrass	*Poa compressa 'Ruebens'*	Cool	Sod	2,500,000	0.5
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	*Lolium perenne 'Citation'*	Cool	Sod	247,000	3.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Total					**7.5**

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Sandy Soil Seed Mix					
Blue grama	*Bouteloua gracilis*	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	*Schizachyrium scoparium 'Camper'*	Warm	Bunch	240,000	1.0
Prairie sandreed	*Calamovilfa longifolia*	Warm	Open sod	274,000	1.0
Sand dropseed	*Sporobolus cryptandrus*	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**10.25**
Heavy Clay, Rocky Foothill Seed Mix					
Ephriam crested wheatgrass[d]	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	*Agropyron intermedium 'Oahe'*	Cool	Sod	115,000	5.5
Vaughn sideoats grama[e]	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.5**

[a] All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

[b] See Table TS/PS-3 for seeding dates.

[c] If site is to be irrigated, the transition turf seed rates should be doubled.

[d] Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

[e] Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

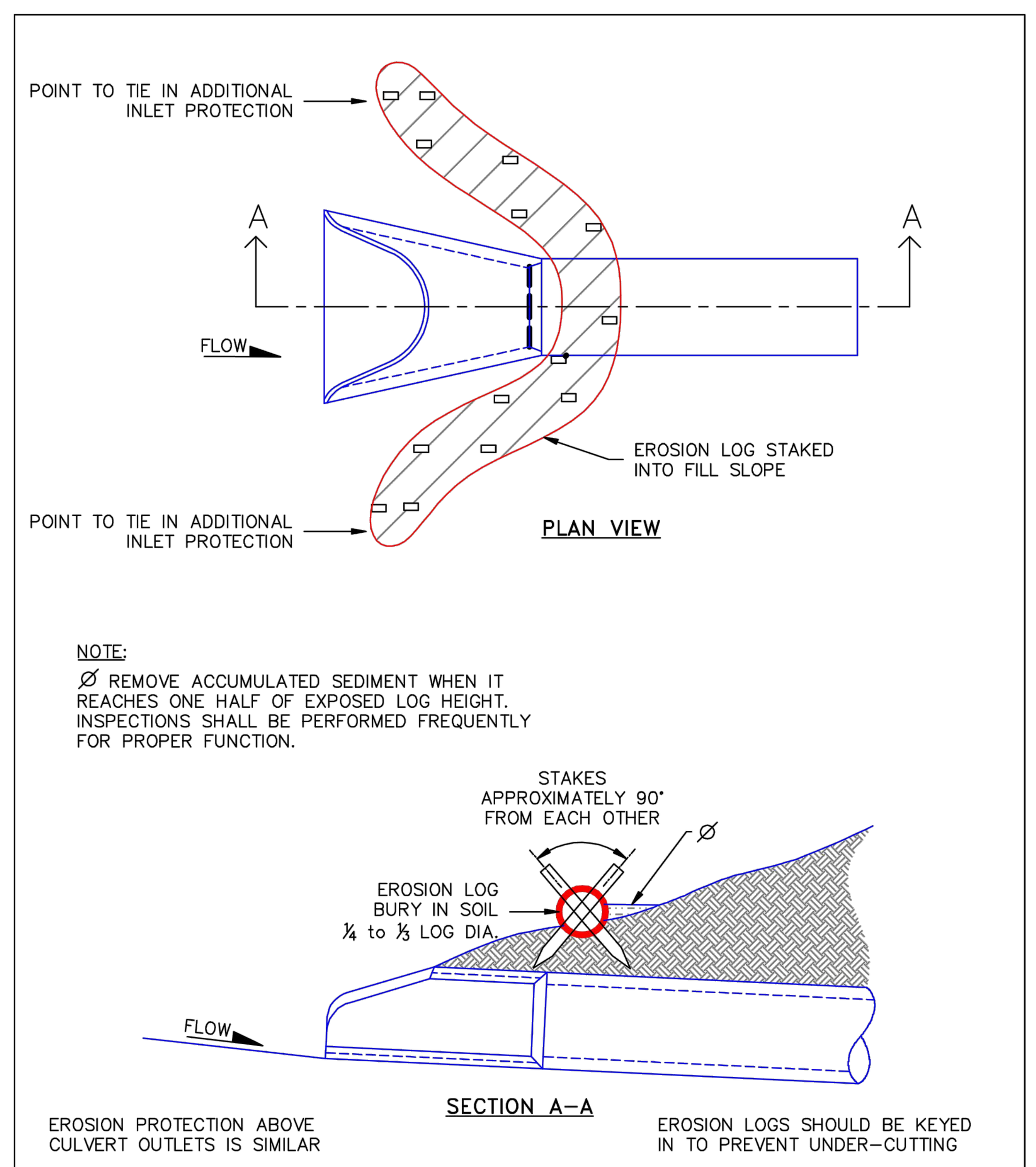
Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.



1/1/08 DATE APPROVED:	Culvert Inlet and Outlet Protection Erosion Logs Above Inlets and Outlets For Slopes 3:1 or Steeper Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
John A. McCarty DEPARTMENT OF TRANSPORTATION	REVISION DATE: 7/17/07 — FILE NAME: SD_3–86	

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6162 S. Willow Drive, Suite 320
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Drawn By:	BLB
Checked By:	RGD
Date:	DECEMBER 2022

GEC DETAILS

G5.5

Sheet 11 of 11

remove Geotech Study from GEC and upload to EDARP under Geotechnical Report

Kumar & Associates, Inc.®
Geotechnical and Materials Engineers and Environmental Scientists

6735 Kumar Heights
Colorado Springs, CO 80918
phone: (719) 632-7009
fax: (719) 632-1049
email: kacolospgs@kumarusa.com
www.kumarusa.com

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GEOTECHNICAL ENGINEERING STUDY
SELF-STORAGE FACILITY
6855 CONSTITUTION AVENUE
COLORADO SPRINGS, COLORADO

Prepared by:
Duane P. Craft, P.E.

COLORADO REGISTERED PROFESSIONAL ENGINEER DUANE P. CRAFT 37553
2/3/22

Reviewed by:
Arben F. Kalaveshi, P.E.

Prepared for:

Johnson Development Associates, Inc.
2259 Campus Drive
El Segundo, CA 90245

Attn: Mr. Brian Kearney

Project No. 21-2-272

February 3, 2022

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SUMMARY

1. A layer of topsoil was encountered in eight of the nine borings, and a surficial layer of aggregate base course was encountered in one boring. The generalized subsurface profile encountered in the borings consisted of a predominantly granular overburden soils, with occasional 1 to 5-foot thick lenses of clay. The native overburden soils extended to the maximum 20 to 25-foot depths explored in Borings 1 thru 8. Man-placed fill was encountered in five of the borings extending to depths between approximately 2.5 to 6 feet. In Boring 9, fill was encountered to the 5-foot depth explored.

2. Groundwater was not encountered at the time of drilling or when the borings were checked 10 days later. Fluctuations in the water level may occur with time, particularly during wetter seasons and after precipitation events.

3. Considering the data obtained from the field and laboratory studies and the nature of the proposed construction, it is our opinion that a shallow foundation system (PT-slabs or spread footings with slab-on-grade floors) would perform adequately if the recommendations provided in this report are followed. The use of a post-tensioned slab foundation will result in the reduced risk of associated distress from foundation movement as compared to a conventional spread footing foundation system, given the foundation system's ability to be rigid and withstand differential movements.

4. Overexcavation and replacement of the existing fill will be required where present below proposed foundation and slab-on-grade floor bearing elevations unless documentation is available for our review stating that it was placed in accordance with the criteria recommended in this report. Additionally, overexcavation and replacement of the expansive clay soils will be required where encountered within 3 feet of foundation and floor bearing elevations. It is expected that once grading and excavations begin, we are present on site to observe test pits and assist the contractor in determining the limits of overexcavation that will be required.

5. The on-site granular soils will be suitable for reuse as nonexpansive fill, including structural fill beneath foundations, floor slabs, and pavements. The existing fill encountered is also suitable for reuse, minus any deleterious materials. Clay soils should be considered unsuitable for use as structural fill. Overlot grading criteria and recommended compaction specifications are included in the report.

6. For areas restricted to automobile traffic, we recommend a minimum full-depth asphalt section of 5.5 inches. For areas with heavier traffic including automobile, single-unit moving trucks, and occasional fire trucks with HS-20 loading, we recommend a minimum 6.5 inches of full depth asphalt. Alternate pavement sections consisting of a composite asphalt/base course and concrete are presented in the report. Trash pickup or loading dock areas or other areas where truck turning movements are concentrated should be paved with a minimum 6.5 inches of portland cement concrete over 4 inches of aggregate base course.

PURPOSE OF STUDY

This report presents the results of a geotechnical engineering study for the proposed self-storage development in Colorado Springs, Colorado. The study was performed in accordance with our Proposal No. C21-356, dated September 22, 2021, for the purpose of developing recommendations for site grading, foundations and pavements. The project site is shown on the attached Fig. 1.

This report has been prepared to summarize the data obtained during this study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to the proposed construction are included in the report.

PROPOSED CONSTRUCTION

We understand the proposed construction will include a single-story building that will have nominal plan dimensions of approximately 545'x185'. No basement or below grade space is anticipated. A paved parking lot will be constructed near the southwest building corner, and an access driveway loop around the perimeter of the building. Site grading is anticipated to consist of cuts and fills on the order of about 5 feet or less to create a level building pad. If the proposed construction varies significantly from that described above or depicted herein, we should be notified to reevaluate the recommendations provided herein.

SITE CONDITIONS

The subject site is located at the southeast corner of Constitution Avenue and Peterson Road in an unincorporated portion of eastern Colorado Springs, Colorado. The property is bound by Constitution Avenue to the north, Peterson Road to the west, Canada Drive to the east, a commercial/recreational venue to the south, followed by medium density residential housing. A relatively small single-story utility building is located in the east-central portion of the lot. The site is enclosed by a chain-link fence with the main entrance off of Canada Drive and a secondary entrance off of Peterson Road. The local topography generally slopes down to the south and east. The west third of the lot is benched above the rest of the site, with two ramps leading west up the bench on the north side and middle of the site. The western third of the lot is raised approximately 6 to 9 feet above the east side of the site as a result of the bench, and sits at grade with Peterson Road and Constitution Avenue. The eastern two thirds of the lot is situated below the grade of Constitution Avenue, ranging from 1 foot below Constitution Avenue on the east end to 9 feet below

Constitution Avenue at the location of the bench. Small to medium sized deciduous trees are located along the east and south sides of the property and sporadically on the western third of the site, in addition to grasses and weeds throughout the remainder of the property.

FIELD EXPLORATION

The field exploration of subsurface conditions consisted of drilling nine borings on January 14, 2022. The boring locations were approximated using a handheld GPS unit, and are shown on Fig. 1. The boring logs are presented on Fig. 2, and corresponding legend and notes are presented on Fig. 3.

The borings were drilled with 4-inch diameter continuous flight augers and were logged by a representative of Kumar & Associates, Inc. Samples of the soils were taken with a 2-inch I.D. California sampler. The sampler was driven into the various strata with blows from a 140-pound hammer falling 30 inches. Penetration resistance values, when properly evaluated, provide an indication of the relative density or consistency of the soils. Depths at which the samples were taken and the penetration resistance values are shown on the boring logs.

LABORATORY TESTING

Samples obtained from the exploratory borings were visually classified in the laboratory by the project engineer and samples were selected for laboratory testing. Laboratory testing included index property tests such as in-situ moisture content and dry unit weight, grain size analysis, and Atterberg limits. Additional testing included in-situ swell-consolidation and concentration of water soluble sulfates. The testing was conducted in general accordance with recognized test procedures, primarily those of the American Society for Testing of Materials (ASTM). Results of the laboratory testing program are shown on Figs. 4 thru 9, and are summarized on Table I.

SUBSURFACE CONDITIONS

A layer of topsoil was encountered in eight of the nine borings, and a surficial layer of aggregate base course was encountered in one boring. The generalized subsurface profile encountered in the borings consisted of a predominantly granular overburden soils, with occasional 1 to 5-foot thick lenses of clay. Man-placed fill was encountered in five of the borings extending to depths between approximately 2.5 to 6 feet. The following subsurface descriptions are of a generalized nature to highlight the soil types encountered in the borings drilled for this study. The boring logs should be reviewed for more detailed information.

Existing Fill: Man-placed fill was encountered in Borings 3, 5, 7 and 8, ranging to depths between approximately 2.5 to 6 feet. In Boring 9, the fill was encountered to the maximum 5-foot depth explored. The fill consisted of a mixture of silty sand (SM) and clayey sand (SC), and appeared to consist of reworked on-site soils. Due to the similarity of the natural soil and fill materials, it was not always possible to clearly differentiate between fill and native soils. Fill materials, where identified, included a mottled appearance of texture and color, which is indicative of disturbed ground. The fill was dry to slightly moist, and varied from tan, brown, dark brown and gray in color. Our study did not determine the exact lateral or vertical extent of the fill. Swell-consolidation test results presented on Fig. 5 indicate the tested sample of clayey sand fill had a low swell potential when wetted under a 1,000 psf surcharge.

Native Granular Soils: The native granular soils encountered were grouped as follows: silty sand (SM) with occasional layers of poorly to well-graded sand with silt (SP-SM, SW-SM), and clayey sand (SC) to silty-clayey sand (SC-SM). These soils were encountered in Borings 1 thru 8, beginning at depths ranging from near surface (below topsoil layer) to 6 feet, and extending to the maximum 20 to 25-foot depths explored. The native granular soils were slightly moist to very moist, and tan to brown in color. Sampler penetration blow counts indicate the granular soils are generally medium dense to very dense.

Native Clay Soils: Native sandy lean clay (CL) with occasional layers of clayey sand (SC) was encountered in five of the nine borings. The clay occurred in deposits that varied between 1 and 5 feet thick. These soils were encountered beginning at depths ranging from near surface (below topsoil layer) in Borings 1 and 2, and at depths between 4 and 17 feet in Borings 4, 5 and 6. The native clay soils were slightly moist to moist, and tan to brown in color. Sampler penetration blow counts indicate the clay soils are stiff to hard in consistency. Swell-consolidation test results presented on Fig. 4 indicate the tested samples of clay varied from having a low swell potential to a low potential for compression, when wetted under a 1,000 psf surcharge.

Groundwater: Groundwater was not encountered at the time of drilling or when the borings were checked 10 days later. Fluctuations in the water level may occur with time, particularly during wetter seasons and after precipitation events. The borings were backfilled with auger cuttings upon completion of water level measurements.

GEOTECHNICAL ENGINEERING CONSIDERATIONS

Considering the data obtained from the field and laboratory studies and the nature of the proposed construction, it is our opinion that a shallow foundation system (PT-slabs or spread footings with slab-on-grade floors) would perform adequately if the recommendations provided in this report are followed.

Overexcavation and replacement of the existing fill will be required where present below proposed foundation and slab-on-grade floor bearing elevations unless documentation is available for our review stating that it was placed in accordance with the criteria recommended in this report. Additionally, overexcavation and replacement of the expansive clay soils will be required where encountered within 3 feet of foundation and floor bearing elevations. The existing fill was encountered in four of the eight borings drilled within the proposed building footprint to depths ranging between 2.5 and 6 feet, and clay soils were encountered near the anticipated bearing elevations in Borings 1, 2 and 6. It is expected that once grading and excavations begin, we are present on site to observe test pits and assist the contractor in determining the limits of overexcavation that will be required.

Assuming foundations and slabs are properly constructed as described in this report, and provided good surface drainage and irrigation practices are designed, constructed and maintained, we estimate a low risk of settlement or heave related movements beyond about 1 inch in magnitude. The use of a post-tensioned slab foundation will result in the reduced risk of associated distress from foundation movement as compared to a conventional spread footing foundation system given the foundation system’s ability to be rigid and withstand differential movements.

The on-site granular soils will be suitable for reuse as nonexpansive fill, including structural fill beneath foundations, floor slabs, and pavements. The existing fill encountered is also suitable for reuse, minus any deleterious materials. The “Site Grading and Earthwork” section of the report provides additional discussion.

FOUNDATION RECOMMENDATIONS

PT-Slab Foundations: We assume the PT-slab foundation will be designed in accordance with the Post-Tensioning Institute's (PTI) publication "Design of Post-Tensioned Slabs-On-Ground (Third Edition, 2004)" with the 2008 supplement. The design method is empirical and was developed in other parts of the country based on assumptions relating clay mineralogy and climate to the soil swell characteristics. Using the PTI design procedure, the PT-slab foundations are designed for differential uplift and settlement of the slab edges, relative to the slab center, caused by seasonal swelling and shrinking cycles of the clay soils supporting the slab.

The PTI design method does not take into account the swell characteristics of highly overconsolidated clay materials, including soils found along the Colorado front range, which are prone to swell but are rarely observed to shrink. Nor does the method use direct measurement of the material swell characteristics, as is routinely done for foundation design in the Colorado front range area. However, our experience indicates that PT-slabs designed using the PTI design methods perform well when the slabs are supported on a layer of fill consisting of on-site or imported moisture-conditioned materials. Because the thickness of the moisture-conditioned fill generally does not extend to the anticipated depth of potential wetting and uplift, the remaining untreated expansive materials have the potential to cause uplift. However, the contribution of the remaining deeper expansive materials to differential uplift is considered to be significantly less than the shallower materials.

The design and construction criteria presented below should be observed for a PT-slab foundation. The construction details should be considered when preparing project documents.

1. We recommend that PT-slab foundations be supported on the native granular soils, or properly compacted nonexpansive fill. Existing fill, where encountered below the building pad should be removed in its entirety and replaced with suitable structural fill, and clay encountered within 3 feet of the base of the foundation should be also be overexcavated in accordance with the criteria presented in the "Site Grading and Earthwork" section of the report. The base of the foundation should be defined as the bottom of the lowest element of the PT-slab (the bottom of the foundation ribs would be considered the lowest point). New structural fill should extend down from the edges of the building pad at a 1 horizontal to 1 vertical projection.

2. Any areas of loose or soft material encountered within the foundation excavation should be removed and replaced with structural fill meeting the material and placement requirements outlined in the “Site Grading and Earthwork” section of this report.

3. PT-slab foundations bearing on compacted suitable fill material placed as recommended herein should be designed for a maximum allowable bearing pressure of 2,500 psf.

4. Based on the method in PTI’s Third Edition, the PT-slabs should be designed using the following criteria:

Criteria	Center Lift	Edge Lift
Moisture variation (e_m) (ft.)	5.3	2.6
Differential swell (y_m) (in.)	0.23	0.52

5. The parameters used to calculate these values include a soil suction (pF) of 3.9 and a Mineral Classification of Zone III. These parameters were selected from the PTI design manual based on soil index parameters; they are not actual measurements or estimates of soil suction and soil moisture distributions across the site.

6. PT-slab beam elements around the slab perimeters and beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. A cover of at least 30 inches is typically used in this area.

7. Once the building pad area has been prepared as described above, it should be protected from excessive wetting or drying until after the foundation has been completed.

8. Proper construction is essential for the adequate performance of a PT-slab foundation. We recommend a contractor experienced in PT-slab construction in this area be retained.

9. All plumbing lines should be tested before operation. Where plumbing lines or other slab protrusions enter through the floor, a positive bond break should be provided. Flexible connections should be provided for slab-bearing mechanical equipment.

10. A representative of the geotechnical engineer should confirm proper subgrade preparations have been met prior to placing foundation formwork. Loose or disturbed material should be removed from the slab subgrade prior to placement of concrete. Placement of structural fill should be observed and tested by a representative of the geotechnical engineer. In addition, representatives of the geotechnical and/or structural engineer should check reinforcement placement immediately prior to concrete placement.

Spread Footings: The design and construction criteria presented below should be observed for a spread footing foundation system. The construction details should be considered when preparing project documents.

1. We recommend that spread footing foundations be supported on the native granular soils or properly compacted nonexpansive fill. Existing fill, where encountered below foundations should be removed in its entirety and replaced with suitable structural fill, and clay encountered within 3 feet of the base of the foundation should be also be overexcavated in accordance with the criteria presented in the "Site Grading and Earthwork" section of the report. New structural fill should extend down from the edges of the foundations at a 1 horizontal to 1 vertical projection.

2. Any areas of loose or soft material encountered within the foundation excavation should be removed and replaced with structural fill meeting the material and placement requirements outlined in the "Site Grading and Earthwork" section of this report.

3. Footings supported on the native granular materials or properly compacted structural fill as recommended herein should be designed for an allowable soil bearing pressure of 2,500 psf.

4. Spread footings should have a minimum footing width of 16 inches for continuous footings and of 24 inches for isolated pads.

5. Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. Placement of foundations at least 30 inches below the exterior grade is typically used in this area.

6. Criteria for the lateral resistance of a spread footing placed on native granular materials or properly compacted structural fill is presented in the "Foundation Walls & Retaining Structures" section of this report.

7. Continuous foundation walls should be reinforced top and bottom to span an unsupported length of at least 10 feet.

8. Granular foundation soils should be densified with a smooth vibratory compactor prior to placement of formwork and reinforcing steel.

9. A representative of the geotechnical engineer should confirm proper subgrade preparations have been met prior to placing foundation formwork. Loose or disturbed material should be removed from the foundation subgrade prior to placement of concrete. Placement of structural fill should be observed and tested by a representative of the geotechnical engineer. In addition, representatives of the geotechnical and/or structural engineer should check reinforcement placement immediately prior to concrete placement.

SITE SEISMIC CRITERIA

Using estimated shear wave velocities for the subgrade materials encountered based on standard penetration testing, calculations indicate a design Site Class D per the International Building Code (IBC). Based on the subsurface profile and the anticipated ground conditions, liquefaction is not a design consideration.

FLOOR SLABS (WITH SPREAD FOOTING FOUNDATIONS)

This section is intended for structures that will utilize a spread-footing foundation, with an isolated interior slab-on-grade floor.

The native granular soils or reconditioned fill are suitable to support light to moderately loaded slab-on-grade construction. Where shallow expansive clay is present near the proposed floor slab elevation, floor slabs will present a difficult problem because sufficient dead load cannot be imposed on them to resist the uplift pressure generated when the materials are wetted and expand. The most positive method to avoid damage as a result of floor slab movement is to construct a structural floor above a well-ventilated crawl space. Based on the moisture-volume change characteristics of the materials encountered, we believe slab-on-ground construction may be used in conjunction with spread footing foundations, provided overexcavation of a portion of the clay is completed as recommended, and provided the resulting risk of distress resulting from slab movement is accepted by the owner. The "Geotechnical Considerations" section discusses the anticipated movement potential.

The following measures should be taken to reduce the damage which could result from movement should the underslab materials be subjected to moisture changes.

1. We recommend that slab-on-grade floors be supported on the native granular soils, or properly compacted nonexpansive fill. Existing fill, where encountered below floor slabs should be removed in its entirety and replaced with suitable structural fill, and clay encountered within 3 feet of the slab bearing elevation should be also be overexcavated in accordance with the criteria presented in the "Site Grading and Earthwork" section of the report.

2. Any areas of loose or soft material encountered at the base of excavation should be removed and replaced with structural fill meeting the material and placement requirements outlined in the "Site Grading and Earthwork" section of this report.

3. Floor slabs should be separated from all bearing walls and columns with expansion joints which allow unrestrained vertical movement.

4. Interior non-bearing partitions resting on floor slabs should be provided with slip joints at the bottoms so that, if the slabs move, the movement cannot be transmitted to the upper structure. This detail is also important for wallboards, stairways and door frames. Slip joints which will allow at least 2 inches of vertical movement are recommended.

5. Floor slabs should not extend beneath exterior doors or over foundation grade beams, unless saw cut at the beam after construction.

6. Floor slab control joints should be used to reduce damage due to shrinkage cracking. The appropriate joint spacing is dependent on slab thickness, concrete aggregate size and slump,

and should be consistent with recognized guidelines such as those of the Portland Cement Association (PCA) or American Concrete Institute (ACI). The joint spacing and any requirements for slab reinforcement should be established by the designer based on experience and the intended slab use.

7. If moisture-sensitive floor coverings will be used, mitigation of moisture penetration into the slabs, such as by use of a vapor barrier, may be required. If an impervious vapor barrier membrane is used, special precautions will be required to reduce potential differential curing problems which could cause the slabs to warp. Section 302.1R of the ACI Manual of Concrete Practice addresses this topic.

8. All plumbing lines should be tested before operation. Where plumbing lines or other slab protrusions enter through the floor, a positive bond break should be provided. Flexible connections should be provided for slab-bearing mechanical equipment.

The precautions and recommendations itemized above will not prevent the movement of floor slabs if the underlying expansive materials are subjected to alternate wetting and drying cycles. However, the precautions should reduce the damage if such movement occurs.

FOUNDATION WALLS AND RETAINING STRUCTURES

Foundation walls and retaining structures which are laterally supported and can be expected to undergo only a moderate amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 55 pcf for backfill consisting of the on-site granular soils, or 50 pcf if a imported CDOT Class I structural backfill is used. Cantilevered retaining structures which can be expected to deflect sufficiently to mobilize the full active earth pressure condition should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 45 pcf for backfill consisting of the on-site granular soils, or 40 pcf for CDOT Class I structural backfill.

All foundation and retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent buildings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the walls and a horizontal backfill surface. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure.

The lateral resistance of a foundation or retaining wall footing placed on undisturbed native granular soils or properly compacted structural fill material will be a combination of the sliding resistance of the foundation on the foundation materials and passive earth pressure against the side of the footing. Resistance to sliding at the bottoms of the footings may be calculated based on an allowable coefficient of friction of 0.3. Passive pressure against the sides of the footings may be calculated using an allowable equivalent fluid unit weight of 180 pcf.

The onsite soils, minus any clay, are suitable for use as wall backfill. Imported granular wall back fill, if used, should meet the requirements of a CDOT Class I structural backfill with less than 20% passing the No. 200 sieve. Proposed material should be approved by the geotechnical engineer prior to use.

The granular backfill behind foundation and retaining walls should be sloped from the base of the wall at an angle of at least 45 degrees from the vertical. Backfill should be placed in uniform lifts and compacted to the criteria presented in the "Site Grading and Earthwork" section of the report. Care should be taken not to overcompact the backfill since this could cause excessive lateral pressure on the walls. Some settlement of deep foundation wall backfills will occur even if the material is placed properly.

WATER SOLUBLE SULFATES

The concentration of water soluble sulfates measured in a sample of the on-site soils obtained from the borings was less than 0.01%. This concentration of water soluble sulfates represents a Class 0 severity exposure to sulfate attack on concrete exposed to these materials. The degree of attack is based on a range of Class 0, Class 1, Class 2, and Class 3 severity exposure as presented in ACI 201. Based on the laboratory data and our experience, we believe special sulfate resistant cement will not be required for concrete exposed to the on-site soils. Concrete containing Type I or I/II cement is commonly used in the area, and is recommended for this project due to its availability.

UNDERDRAIN SYSTEM

Based on our understanding that there will be no basement or below grade space, it is our opinion an underdrain system will not be necessary for the building. If the proposed construction differs from our assumptions, we should be consulted to reevaluate the recommendations for an underdrain in these areas.

SURFACE DRAINAGE

Proper surface drainage is very important for acceptable performance of the building during construction and after the construction has been completed. Drainage recommendations provided by local, state and national entities should be followed based on the intended use. The following recommendations should be used as guidelines and changes should be made only after consultation with the geotechnical engineer.

1. Excessive wetting or drying of foundation and slab subgrades should be avoided during construction.

2. The ground surface surrounding the exterior of the building and other structures should be sloped to drain away from the foundations in all directions. We recommend a minimum slope of 6 inches in the first 10 feet in unpaved areas. Site drainage beyond the 10-foot zone should be designed to promote runoff and reduce water infiltration. A minimum slope of 3 inches in the first 10 feet is recommended in the paved areas. These slopes may be changed as required for handicap access points in accordance with the Americans with Disabilities Act.

3. Ponding of water should not be allowed in backfill material or in a zone within 10 feet of foundations or foundation walls, whichever is greater.

4. Roof downspouts and drains should discharge well beyond the limits of all backfill.

5. Excessive landscape irrigation should be avoided within 10 feet of the foundation walls.

6. If the nearby ground surface slopes towards a building, we recommend a swale be constructed to intercept and redirect surface runoff around and away from the building. The

swale should be located a minimum of 10 feet from the foundation, and should be graded at a minimum 2% slope.

PAVEMENT DESIGN

Subgrade Materials: Based on the results of the field exploration and laboratory testing programs, the pavement subgrade materials encountered at the site classify as A-2-4, A-2-6, A-4, A-6 and A-7-6 with group indices ranging from 0 to 10 in accordance with the American Association of State Highway and Transportation Officials (AASHTO) soil classification system. An R-value of 10 and a resilient modulus value of 3,562 psi were assumed for design of flexible pavements, and a subgrade modulus of 100 pci was assumed for design of rigid pavements. The pavement design has also assumed any clay materials encountered within 2 feet of pavement grade (as referenced from bottom or asphalt or aggregate base course layer, whichever is lower) would be removed and replaced with suitable nonexpansive fill.

Design Traffic: Detailed traffic loading information for the planned pavement areas was not available to us at the time of our study. We have assumed traffic will primarily consist of automobiles, single-unit moving trucks, and occasional fire truck access with HS-20 loading. Based on our experience with similar facilities, for our pavement thickness design calculations, we assumed an equivalent 18-kip daily load application (EDLA) of 5 for areas restricted to automobile traffic (such as auto parking stalls), and 15 for areas of combined auto and truck traffic (such as drive lanes). If it is determined that actual traffic is significantly different from that estimated, we should be contacted to reevaluate the pavement thickness design.

Pavement Sections: The recommended sections were determined using the DARWin 3.01 pavement design software based on the 1993 AASHTO pavement design procedures. Based on the subgrade conditions encountered and the traffic information provided, we recommend the following pavement sections:

Traffic	Pavement Section Thickness (in.)		
	Full Depth Asphalt	Composite Asphalt over Base Course	Portland Cement Concrete over Base Course
Light Duty (Areas restricted to automobile traffic)	5.5	4 over 6	6 over 4
Heavy Duty (Areas w/autos, occasional trucks)	6.5	5 over 6	6.5 over 4

We recommend trash pickup or loading dock areas, and other areas where truck turning movements are concentrated be paved with the portland cement concrete (Heavy Duty) section rather than one of the asphalt alternatives. The use of a flexible pavement in these areas could result in pavement fatigue cracking and/or rutting/shoving of the pavement due to the concentrated wheel loads.

Subgrade Preparation: Fill placed for support of pavements should meet the material and compaction requirements for structural fill presented in the "Site Grading and Earthwork" section of this report.

To reduce the potential magnitude of pavement heave and distress caused by swelling of the clays, we recommend these materials be removed and replaced with nonexpansive fill where encountered within 2 feet of the pavement grade (as referenced from bottom or asphalt or aggregate base course layer, whichever is lower). At the base of the overexcavation, the entire subgrade area should be overexcavated scarified to a depth of 12 inches, moisture conditioned as necessary, and compacted to 95% of the standard Proctor (ASTM D698) maximum dry density. Increasing the depth of moisture conditioning would further reduce the magnitude of potential movements.

The pavement subgrade should be proofrolled with a heavily loaded pneumatic-tired vehicle or a heavy, smooth drum roller compactor. Pavement design procedures assume a stable subgrade. Areas that deform excessively under heavy wheel loads are not stable and should be removed and replaced to achieve a stable subgrade prior to paving.

Drainage: The collection and diversion of surface drainage away from paved areas is extremely important to the satisfactory performance of pavement. Drainage design should provide for the removal of water from paved areas and prevent the wetting of the subgrade soils.

Pavement Materials: The asphalt pavement should consist of a bituminous material which meets the requirements of the Pikes Peak Region Asphalt Paving Specifications. Given the assumed traffic loading, we recommend the mix have a binder grade of PG 58-28 or PG 64-22, and a design gyration (Ndes) of 75. In the event that a PG 64-22 asphalt binder is used in the mix, the asphalt section will provide adequate structural support but will be subject to a higher potential for low temperature related transverse cracking. The mix grading should consist of a Grading S for the lower lifts, and a grading SX for the top lift. Grading S may also be acceptable for the top lift.

Aggregate base course should be a Class 6 material conforming to the requirements presented in Section 703.03 of the CDOT Standard Specifications for Road and Bridge Construction.

Concrete pavement should meet the requirements of a Class P Mix, per Section 601 of the CDOT Standard Specifications, and should be based on a mix design established by a qualified engineer. The concrete should contain transverse joints not greater than 12 to 15 feet on centers and longitudinal joints no greater than 14 feet. The joints should be hand formed, sawed or formed by premolded filler. The joints should be at least 1/4 of the slab thickness. Expansion joints should be provided at the end of each construction sequence and between the concrete slab and adjacent structures. Expansion joints where required, should be filled with a ½ inch-thick asphalt impregnated fiber. Concrete should be cured by protecting against loss of moisture, rapid temperature changes and mechanical injury for at least three days after placement. The concrete sections presented above are assumed to be unreinforced. Providing dowels at construction joints would help reduce the risk of differential movements between panel sections. Providing a grid mat of deformed rebar or welded wire mesh within the concrete pavement section would assist in mitigating corner breaks and differential panel movements. If a rebar mat is installed, we recommend that the bars be placed in the lower half of the pavement section. Also, if reinforcing is used, we have commonly seen No. 4 rebar placed at 24-inch center in each direction, however, we recommend that a structural engineer evaluate the placement and spacing of rebar if needed.

<u>Maintenance</u>: Periodic maintenance of paved areas is critical to achieve the design life of the pavement. Crack sealing should be performed annually as new cracks appear. Chip seals, fog seals, or slurry seals applied at approximate intervals of 3 to 5 years are usually necessary for asphalt. As conditions warrant, it may be necessary to perform patching and overlay at approximate 10-year intervals.

SITE GRADING AND EARTHWORK

<u>Temporary Excavations</u>: We recommend temporary excavation slopes be constructed in accordance with OSHA regulations. In accordance with OSHA criteria, the on-site native granular soils and existing fill should be considered a Type C soil due to the variability of material properties. The native clay soils classify as a Type B material, however, considering the intermittent occurrence of the clays, we recommend the overburden soils as a whole be considered a Type C material. Temporary unretained excavations should have slopes no steeper than 1.5:1 (H:V) in Type C soils. A properly braced excavation or the use of a trench box should be used where the indicated unretained slopes cannot be accommodated. Flatter slopes will be required where groundwater seepage is encountered. OSHA regulations require that excavations greater than 20 feet in depth be designed by a professional engineer. If soils different from those indicated in this report are encountered, the OSHA soil type may vary and the required cut slopes may need to be adjusted. A contractor's competent person should make decisions regarding cut slopes.

Excavated slopes may soften or loosen due to construction traffic and erode from surface runoff. Measures to keep surface runoff from excavation slopes, including diversion berms, should be considered.

<u>Excavation Considerations</u>: In our opinion, the overburden soils encountered in the exploratory borings drilled for this study can be excavated with heavy-duty construction equipment. Based on the subsurface conditions encountered, we do not anticipate dewatering to be necessary during construction.

<u>Cut and Fill Slopes</u>: Permanent cut and fill slopes should not be steeper than 3:1 (horizontal to vertical). Slopes will generally be stable at 2:1; however, 2:1 slopes will be prone to increased surface erosion and it will be difficult to maintain vegetation on them. The risk of slope instability will be significantly increased if seepage is encountered in cuts. If seepage is encountered in

permanent excavations, an investigation should be conducted to determine if the seepage will adversely affect the cut stability.

Good surface drainage should be provided for all permanent cuts and fills to direct the surface runoff away from the slope faces. Permanent cut and fill slopes and other stripped areas should be protected against erosion by revegetation or other means. Fills should be benched into hillsides exceeding 4 horizontal to 1 vertical. Site grading should be planned to provide positive surface drainage away from all building and pavement areas.

No formal stability analyses were performed to evaluate the slopes recommended above. Published literature and our experience with similar cuts and fills indicate the recommended slopes should have adequate factors of safety. If a detailed stability analysis is required, we should be notified.

Fill Material: Unless specifically modified in the preceding sections of this report, the following recommended material and compaction requirements are presented for structural fills on the project site. A geotechnical engineer should evaluate the suitability of all proposed fill materials for the project prior to placement.

1. *Nonexpansive Structural Fill*: With proper moisture conditioning, the on-site native granular soils will be suitable for reuse as nonexpansive fill, including structural fill beneath foundations, slabs, and pavements. The existing fill encountered is also suitable for reuse, minus any deleterious materials. Clay soils should be considered unsuitable for use as structural fill. New fill should extend down from the edge of foundations at a minimum 1:1 horizontal to vertical projection.

   Imported structural fill, if required, should consist of nonexpansive soil material having a maximum of 50% passing the No. 200 sieve, and a maximum plasticity index of 15. (We recognize that some of the tested samples of the onsite granular soils do not meet these specifications; however, given the properties, it is our opinion they would be acceptable for reuse as structural fill, if properly moisture conditioned.) Import fill source materials not meeting the above liquid limit and plasticity index criteria may be acceptable (provided the minimum percentage passing the No. 200 sieve is satisfied) if the swell potential when remolded to 98% of the ASTM D 698 (standard Proctor) maximum dry density at optimum moisture content under a 200 psf surcharge pressure does not exceed 1%. Evaluation of potential sources would then require determination of laboratory moisture-density relationships and swell consolidation tests on remolded samples, thereby adding time and cost to evaluate proposed fill materials.

2. *Utility Trench Backfill*: Materials excavated from the utility trenches may be used for trench backfill above the pipe zone fill provided they do not contain unsuitable material or particles larger than 4 inches.

3. *Material Suitability*: All fill material should be free of vegetation, brush, sod, trash and debris, and other deleterious substances, and should not contain rocks or lumps having a diameter of more than 6 inches.

4. *Subgrade Preparation*: The ground surface shall be stripped of vegetation/organics prior to fill placement. The resulting ground surface should be scarified to a depth of 12 inches, moisture conditioned as necessary, and compacted in a manner specified below for the subsequent layers of fill. Loose or unstable soils shall be removed, where present, in order to provide a stable platform prior to placement of fill.

5. *Existing Fill*: Any existing fill encountered should be considered unsuitable for support of foundations and floor slabs, unless documentation can be provided stating in was properly compacted. We recommend the existing fill, where present in these areas, be overexcavated, moisture conditioned, and placed back properly compacted. Provided the owner understands and accepts the potential for differential subgrade movement and the resulting increased potential for distress, overexcavation of the existing fill in pavement areas is not required, as these items can typically tolerate movement and are more easily repaired. If it is preferred to reduce the magnitude of potential movements, we recommend overexcavation of the existing fill to a minimum depth of 2 feet in pavement areas.

6. *Overexcavation of Clays*: We recommend the expansive clays be overexcavated and replaced with a nonexpansive structural fill, where present within 3 feet of the bottom of foundations and floor slabs. For PT-slab foundations, the overexcavation of 3 feet should

be referenced from the bottom the lowest portion of the foundation element/rib. Depending on the amount of site grading planned, partial or no overexcavation may be applicable provided there is adequate separation between the foundation bearing elevation and the expansive materials. For pavement areas and other areas with movement sensitive exterior flatwork, we recommend a minimum 2-foot overexcavation and replacement. Based on our understanding of the proposed grades and the conditions encountered in our boring logs, it appears overexcavation of clay will be required for portions of building represented by Borings 1, 2 and 6. Overexcavation of clays in pavement areas is anticipated to be localized to areas represented by Borings 1 and 2. It is expected that once grading and excavations begin, we are present on site to observe test pits and assist the contractor in determining the limits of overexcavation that will be required.

Compaction Requirements: A representative of the geotechnical engineer should observe fill placement operations on a full-time basis. We recommend the following minimum compaction criteria be used on the project.

Area	Percentage of Standard Proctor Maximum Dry Density (ASTM D 698)
Building Pad	98%
Floor Slab Subgrade	95%
Foundation Wall Backfill	95%
Beneath Pavement Areas/Exterior Flatwork/Utility Trenches	95%
Retaining Wall Subgrade	98%
Retaining Wall Backfill	95%
Landscape and Other Misc. Overlot Fill Areas	95%
Compaction of granular soils should be achieved at a moisture content within +/- 2% of the optimum. Clay materials should be placed at a moisture content within -1% to +3% of the optimum.	

DESIGN AND CONSTRUCTION SUPPORT SERVICES

Kumar & Associates, Inc. should be retained to review the project plans and specifications for conformance with the recommendations provided in our report. We are also available to assist the design team in preparing specifications for geotechnical aspects of the project, and performing additional studies if necessary to accommodate possible changes in the proposed construction.

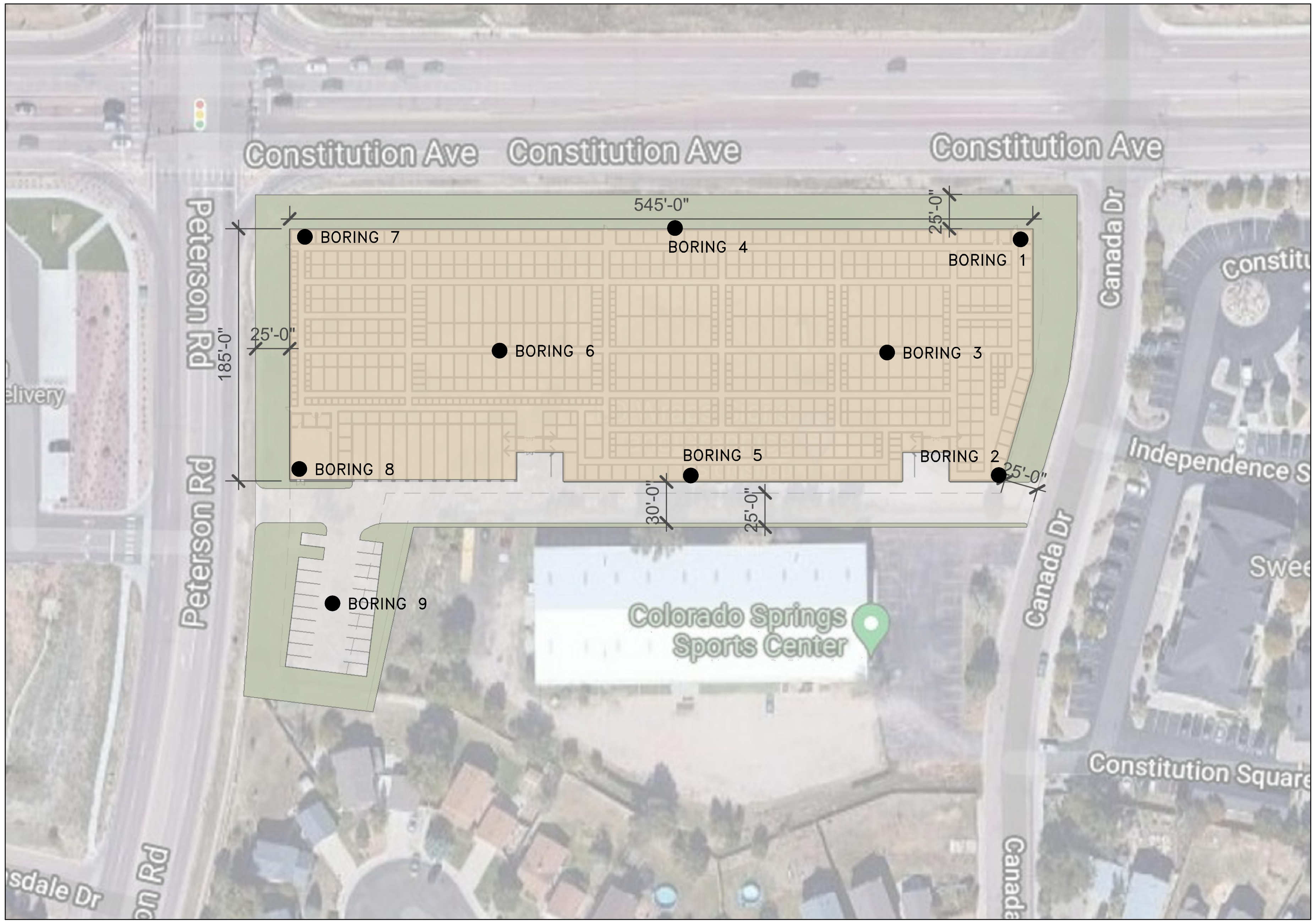
We recommend that Kumar & Associates, Inc. be retained to provide construction observation and testing services to document that the intent of this report and the requirements of the plans and specifications are being followed during construction. This will allow us to identify possible variations in subsurface conditions from those encountered during this study and to allow us to re-evaluate our recommendations, if needed. We will not be responsible for implementation of the recommendations presented in this report by others, if we are not retained to provide construction observation and testing services.

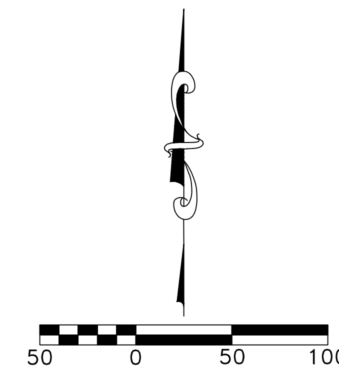
LIMITATIONS

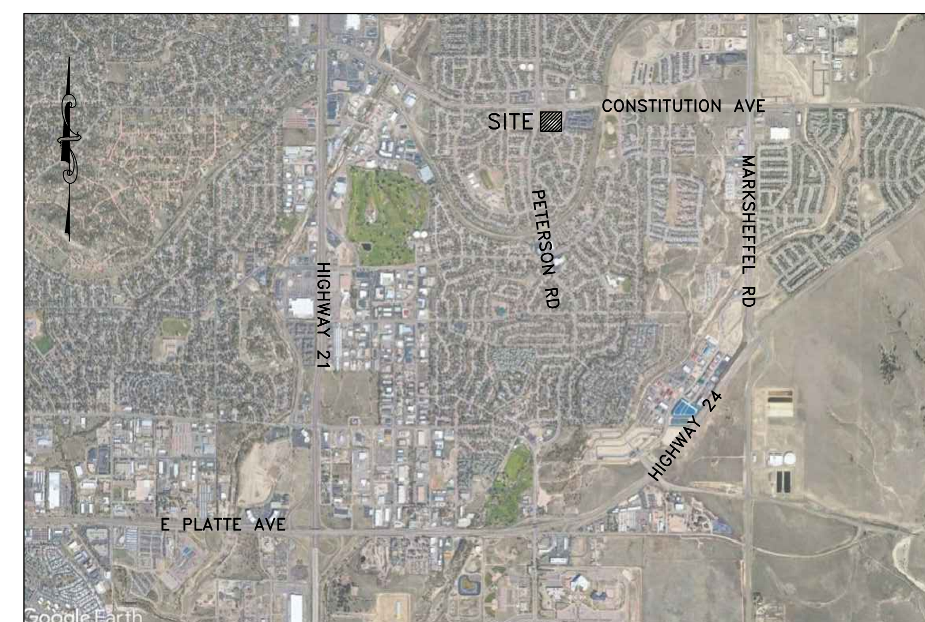
This study has been conducted for exclusive use by the client for geotechnical related design and construction criteria for the project. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings at the locations indicated on Fig. 1 or as described in the report, and the proposed type of construction. This report may not reflect subsurface variations that occur, and the nature and extent of variations across the site may not become evident until site grading and excavations are performed. If during construction, fill, soil, rock or water conditions appear to be different from those described herein, Kumar & Associates, Inc. should be advised at once so that a re-evaluation of the recommendations presented in this report can be made. Kumar & Associates, Inc. is not responsible for liability associated with interpretation of subsurface data by others.

Swelling soils occur on this site. Such soils are stable at their natural moisture content but will undergo volume changes with changes in moisture content. The extent and amount of perched water beneath the building site as a result of area irrigation and inadequate surface drainage is difficult, if not impossible, to foresee. The recommendations presented in this report are based on current theories and experience of our engineers on the behavior of swelling soil in this area. The owner should be aware that there is a risk in constructing a building in an area with expansive soils. Following the recommendations given by a geotechnical engineer, careful construction practice and prudent maintenance by the owner can, however, decrease the risk of foundation movement due to expansive soils.

DPC:th







VICINITY MAP
NOT TO SCALE

21–2–272	Kumar & Associates	PROPOSED SELF–STORAGE FACILITY	LOCATION OF EXPLORATORY BORINGS	Fig. 1

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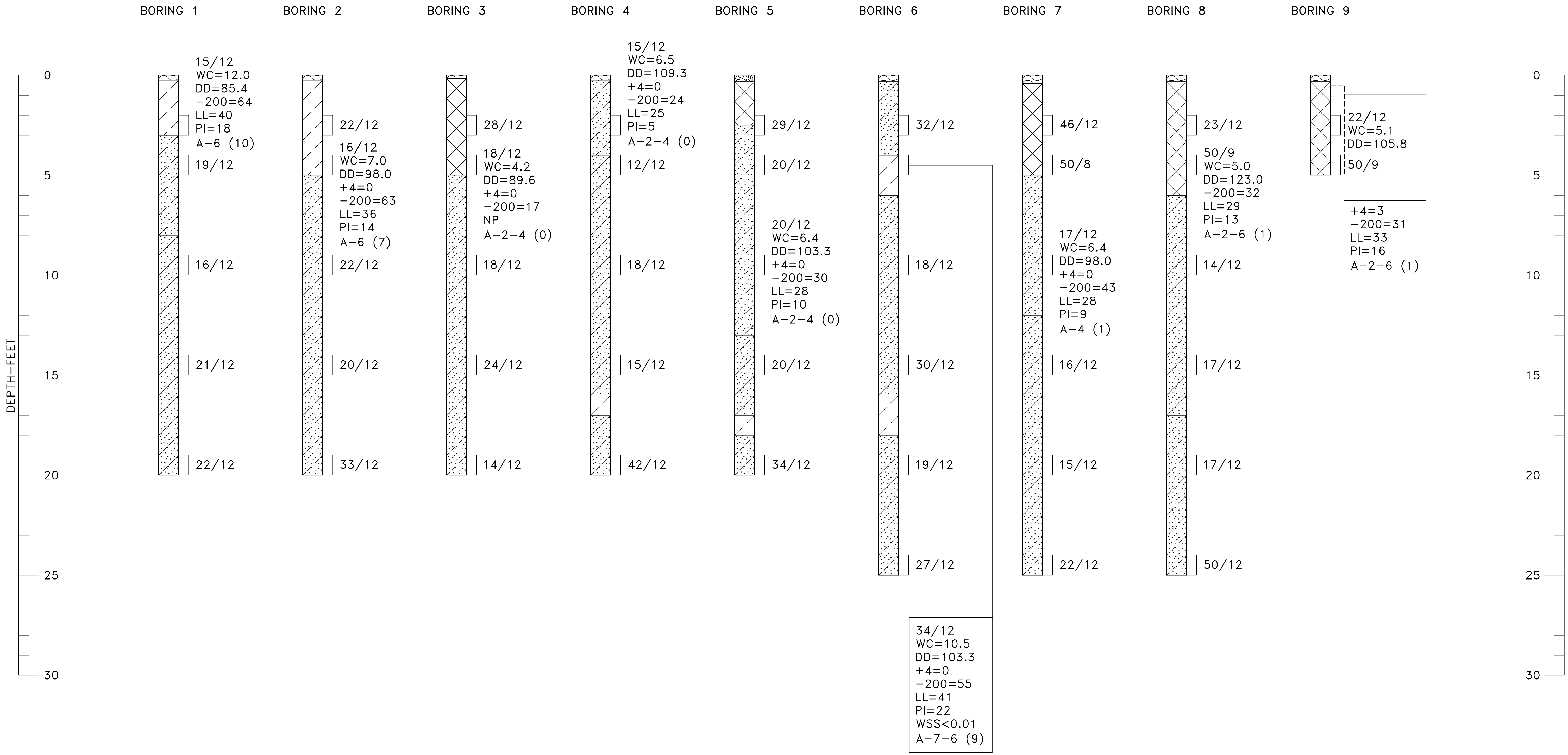


21−2−272	Kumar & Associates	PROPOSED SELF−STORAGE FACILITY	LOGS OF EXPLORATORY BORINGS	Fig. 2

LEGEND

TOPSOIL.

AGGREGATE BASE COARSE.

FILL: SILTY TO CLAYEY SAND (SM,SC), DRY TO SLIGHTLY MOIST, TAN, BROWN, DARK BROWN AND GRAY.

SILTY SAND (SM), WITH OCCASIONAL LAYERS OF POORLY TO WELL GRADED SAND WITH SILT (SP–SM, SW–SM), MEDIUM DENSE TO DENSE, SLIGHTLY MOIST TO MOIST, TAN TO BROWN.

CLAYEY SAND (SC) TO SILTY–CLAYEY SAND (SC–SM), MEDIUM DENSE TO VERY DENSE, SLIGHTLY MOIST TO MOIST, TAN TO BROWN.

SANDY LEAN CLAY (CL), WITH OCCASIONAL LAYERS OF CLAYEY SAND (SC), STIFF TO HARD, SLIGHTLY MOIST TO MOIST, TAN TO BROWN.

DRIVE SAMPLE, 2–INCH I.D. CALIFORNIA LINER SAMPLE.

DISTURBED BULK SAMPLE.

15/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 15 BLOWS OF A 140–POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

NOTES

1. THE EXPLORATORY BORINGS WERE DRILLED ON JANUARY 14, 2022 WITH A 4–INCH–DIAMETER CONTINUOUS–FLIGHT POWER AUGER.

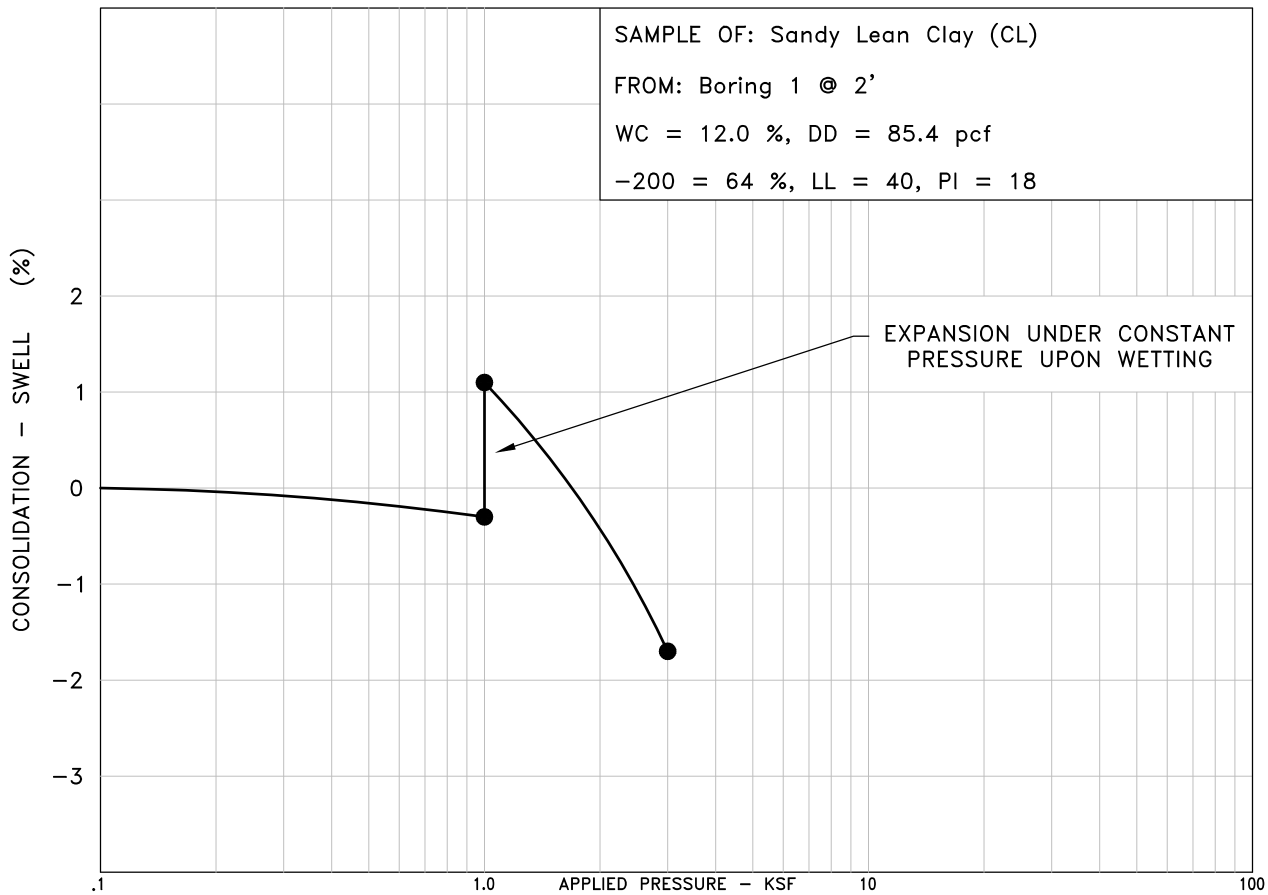
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE APPROXIMATED BY HANDHELD GPS DEVICE AND SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

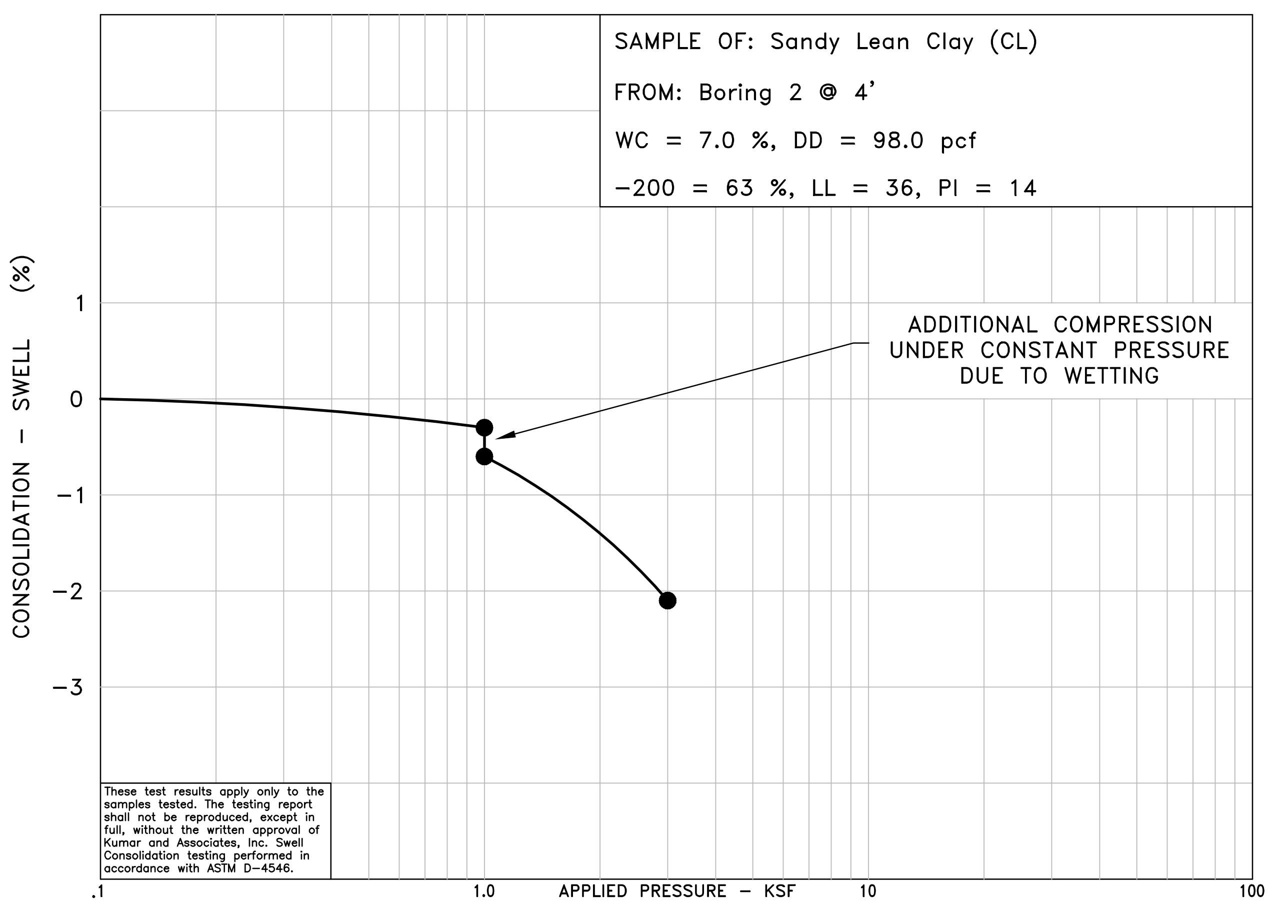
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE NOT MEASURED AND THE LOGS OF THE EXPLORATORY BORINGS ARE PLOTTED TO DEPTH.

4. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.

5. GROUNDWATER WAS NOT ENCOUNTERED IN THE BORINGS AT THE TIME OF DRILLING. FLUCTUATIONS IN THE WATER LEVEL MAY OCCUR WITH TIME.

6. LABORATORY TEST RESULTS:
   WC = WATER CONTENT (%) (ASTM D2216);
   DD = DRY DENSITY (pcf) (ASTM D2216);
   +4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D6913);
   –200= PERCENTAGE PASSING NO. 200 SIEVE (ASTM D1140);
   LL = LIQUID LIMIT (ASTM D4318);
   PI = PLASTICITY INDEX (ASTM D4318);
   NP = NON–PLASTIC (ASTM D 4318);
   WSS = WATER SOLUBLE SULFATES (%) (CP–L 2103);
   A–6 (10) = AASHTO CLASSIFICATION (GROUP INDEX) (AASHTO M145).





21-2-272	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULTS	Fig. 4

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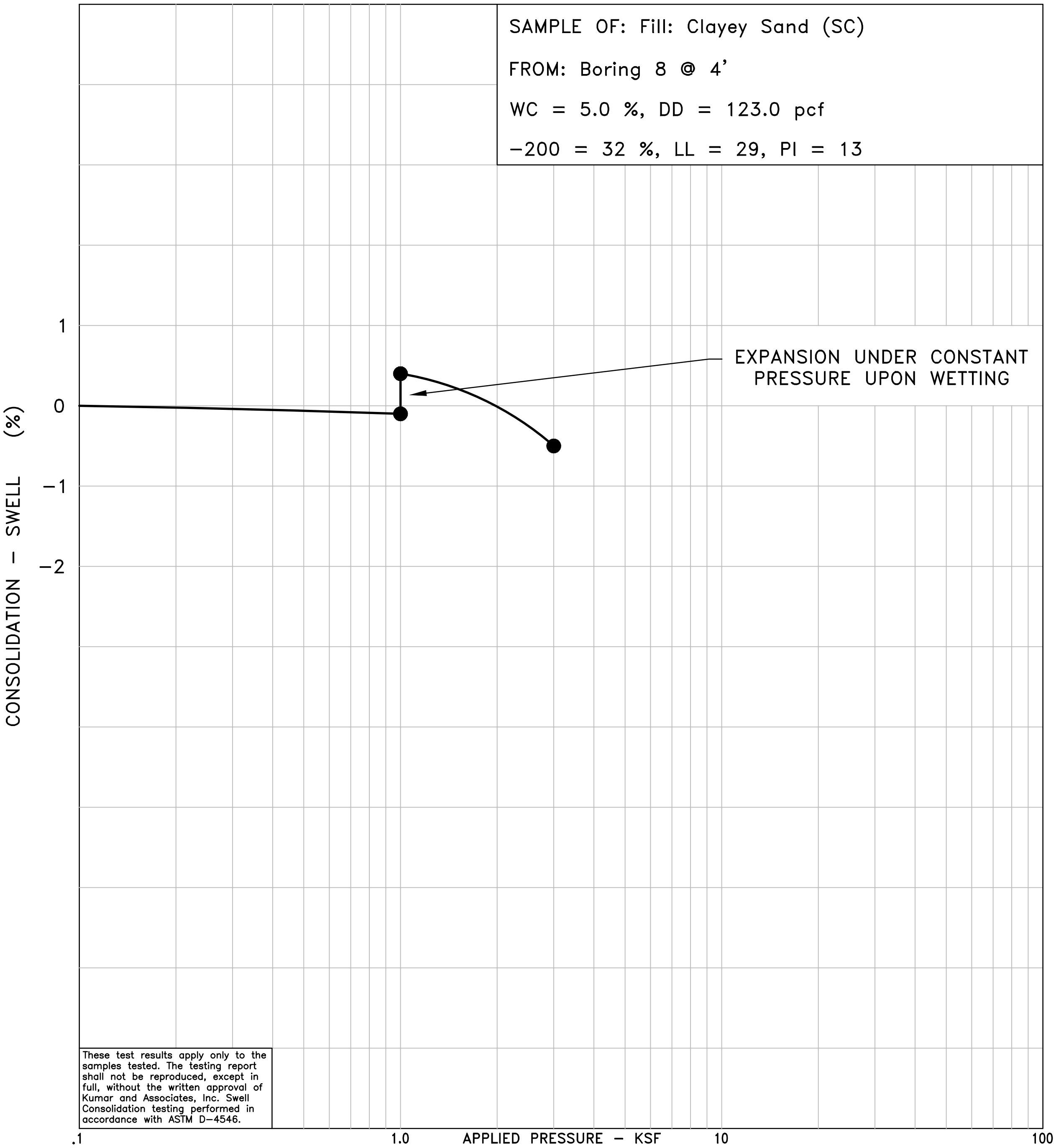

21−2−272	Kumar & Associates	SWELL−CONSOLIDATION TEST RESULTS	Fig. 5

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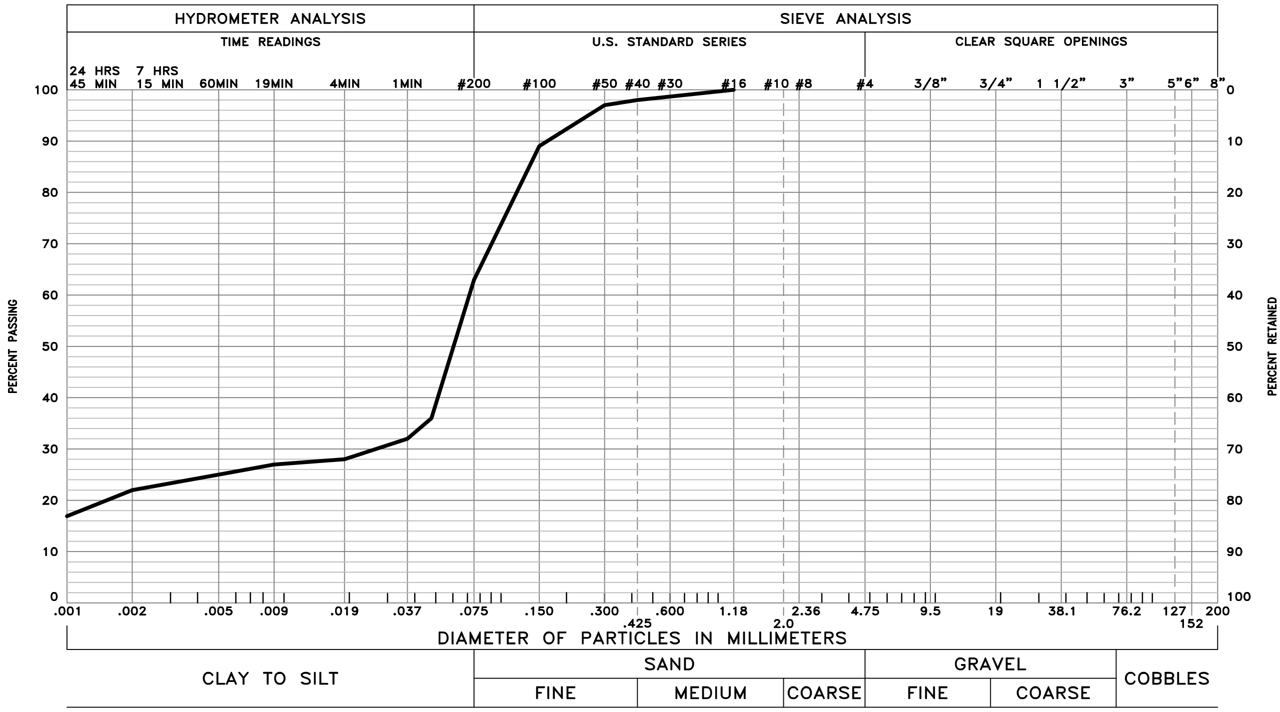
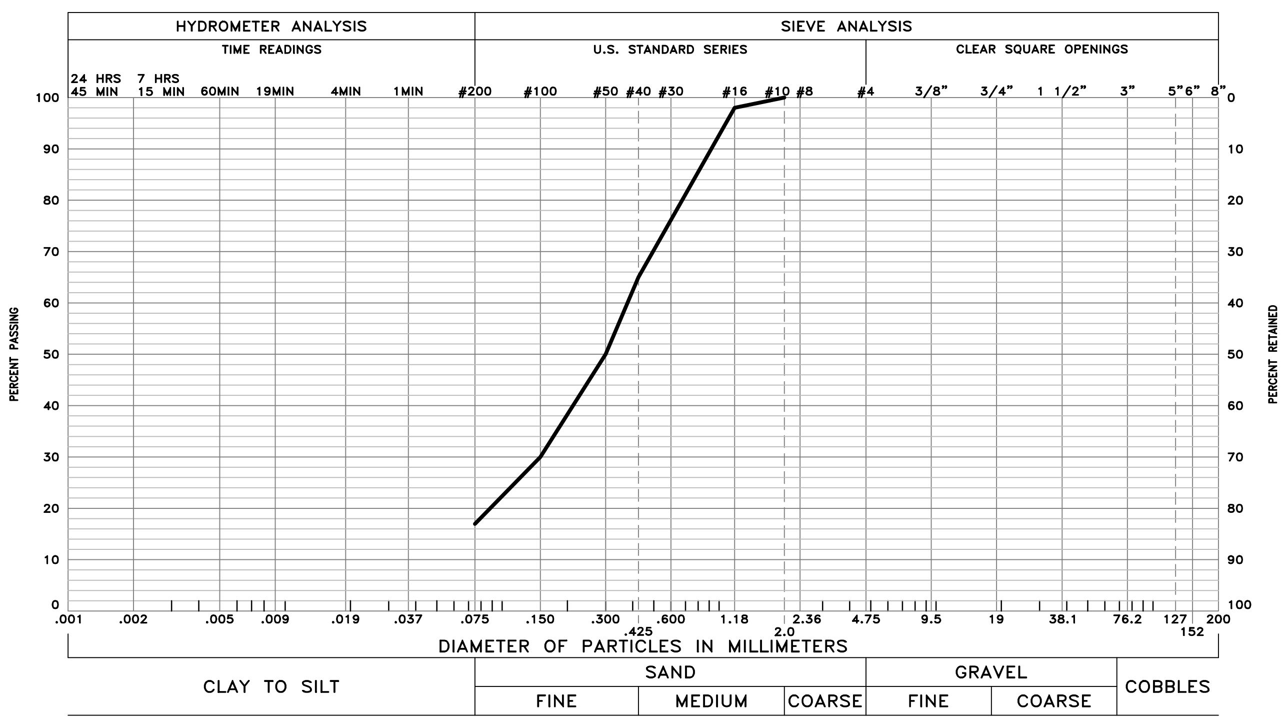


GRAVEL 0 % SAND 37 % SILT AND CLAY 63 %

LIQUID LIMIT 36 PLASTICITY INDEX 14

SAMPLE OF: Sandy Lean Clay (CL) FROM: Boring 2 @ 4'



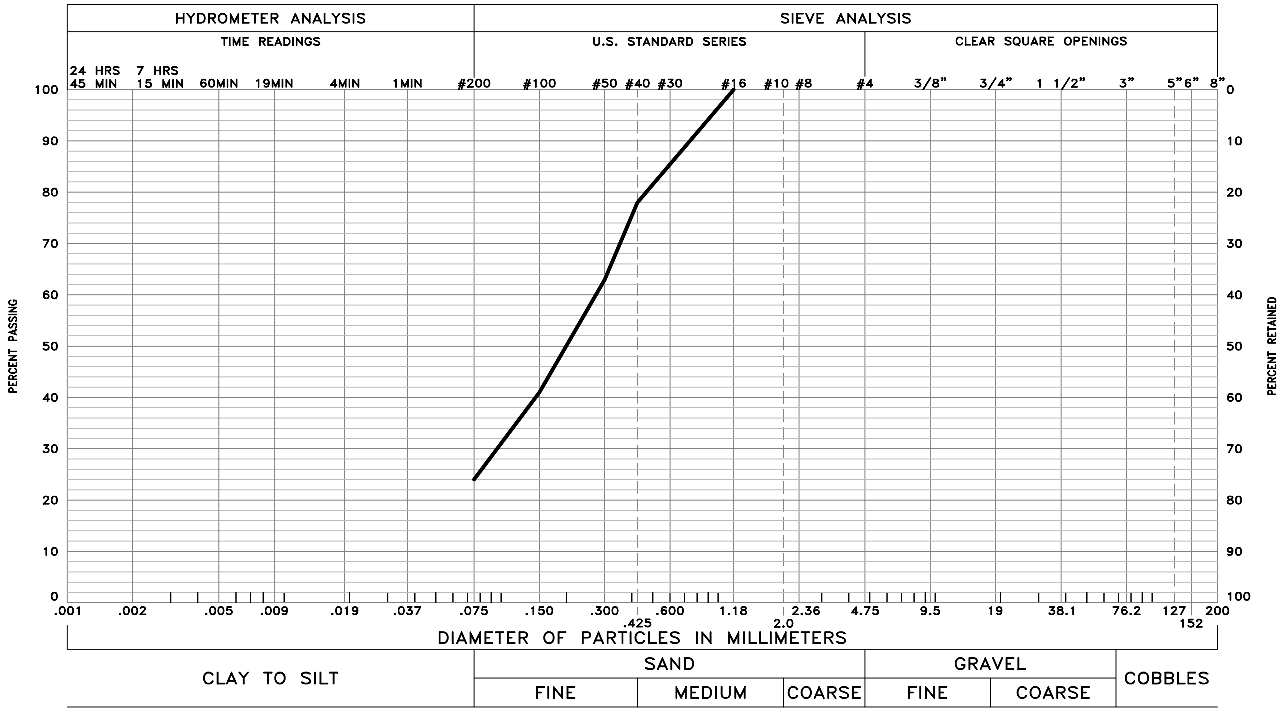
GRAVEL 0 % SAND 83 % SILT AND CLAY 17 %

LIQUID LIMIT – PLASTICITY INDEX NP

SAMPLE OF: Fill: Silty Sand (SM) FROM: Boring 3 @ 4'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.

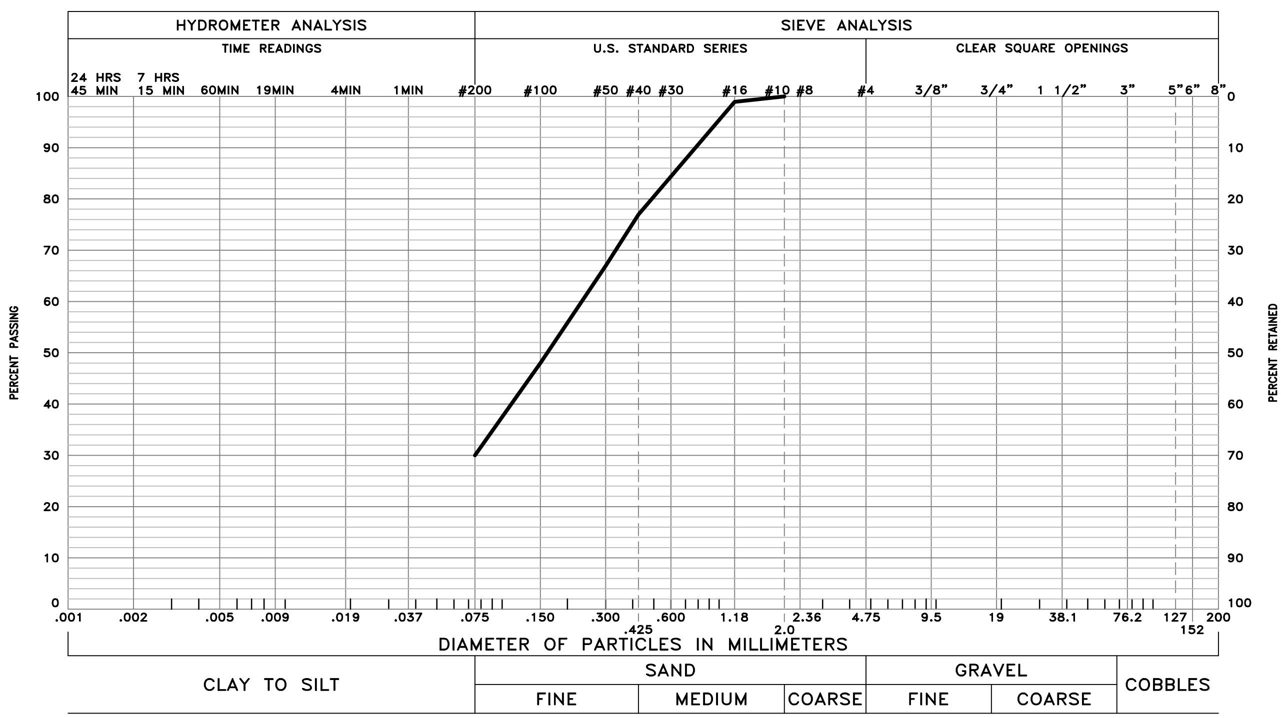
21–2–272	Kumar & Associates	GRADATION TEST RESULTS	Fig. 6



GRAVEL 0 % SAND 76 % SILT AND CLAY 24 %

LIQUID LIMIT 25 PLASTICITY INDEX 5

SAMPLE OF: Silty Clayey Sand (SC–SM) FROM: Boring 4 @ 2'



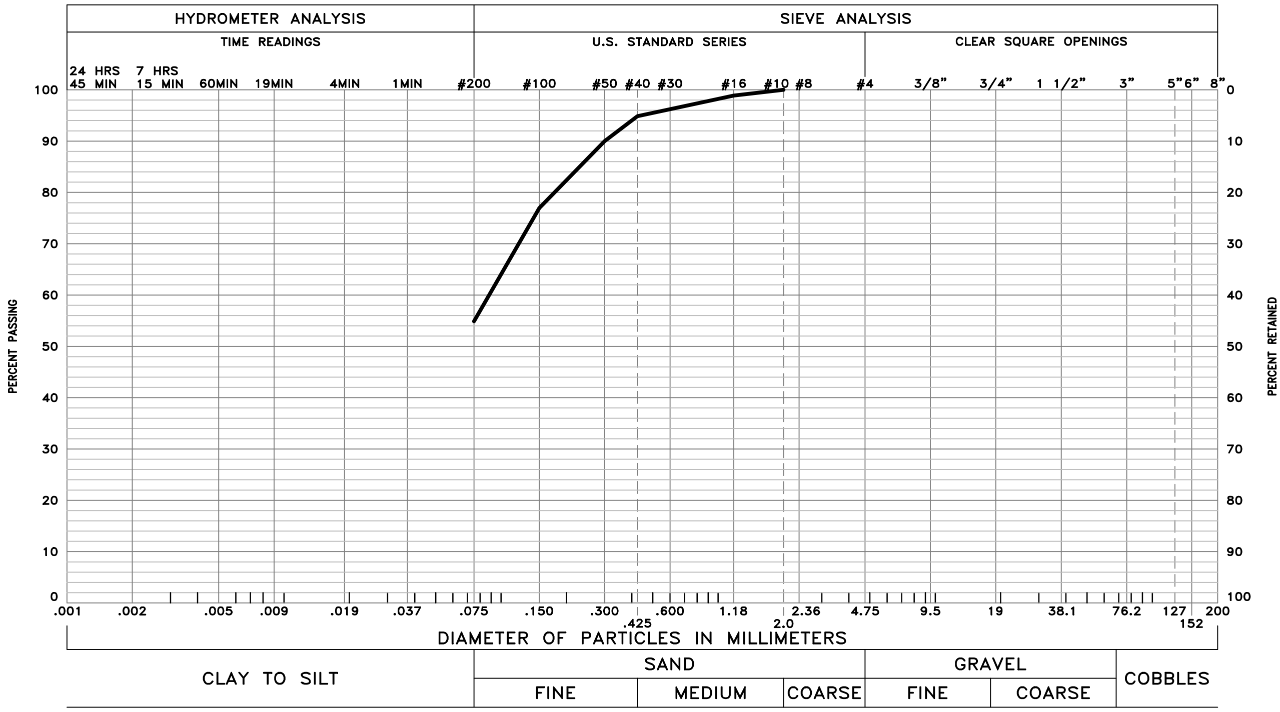
GRAVEL 0 % SAND 70 % SILT AND CLAY 30 %

LIQUID LIMIT 28 PLASTICITY INDEX 10

SAMPLE OF: Clayey Sand (SC) FROM: Boring 5 @ 9'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.

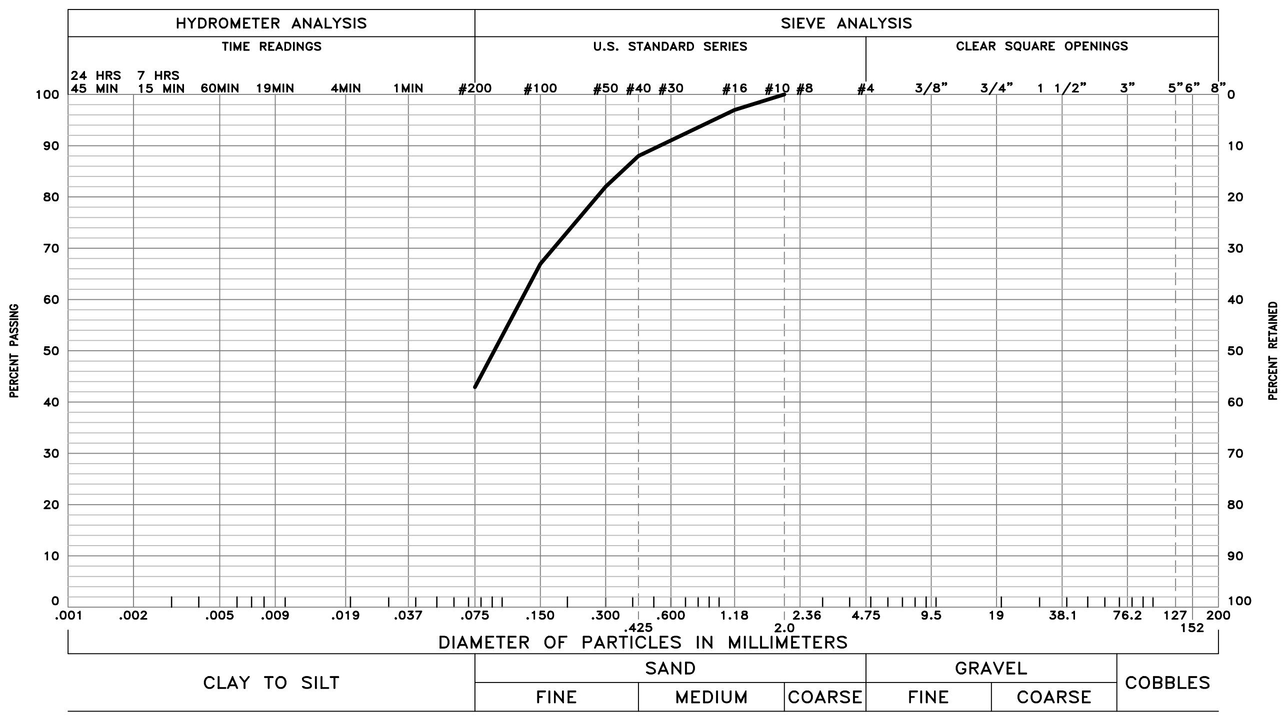
21–2–272	Kumar & Associates	GRADATION TEST RESULTS	Fig. 7



GRAVEL 0 % SAND 45 % SILT AND CLAY 55 %

LIQUID LIMIT 41 PLASTICITY INDEX 22

SAMPLE OF: Sandy Lean Clay (CL) FROM: Boring 6 @ 4'

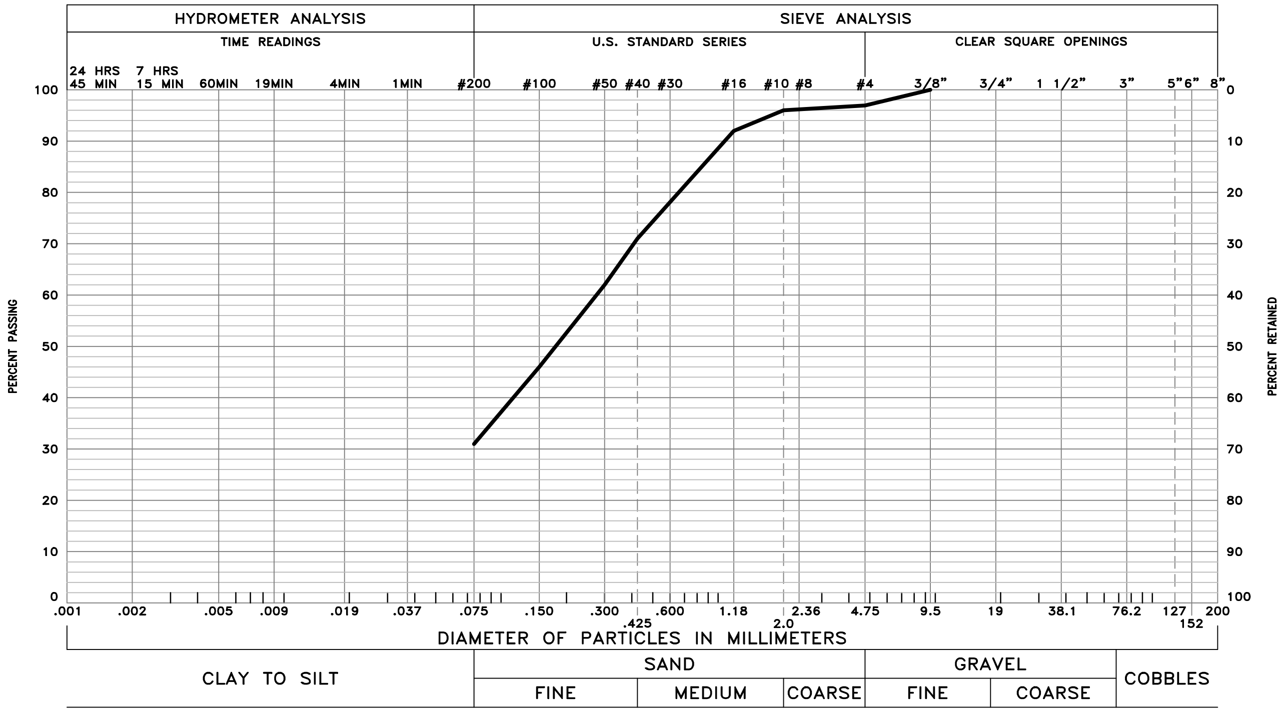


GRAVEL 0 % SAND 57 % SILT AND CLAY 43 %

LIQUID LIMIT 28 PLASTICITY INDEX 9

SAMPLE OF: Clayey Sand (SC) FROM: Boring 7 @ 9'

 Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.



GRAVEL 3 % SAND 66 % SILT AND CLAY 31 %

LIQUID LIMIT 33 PLASTICITY INDEX 16

SAMPLE OF: Fill: Clayey Sand (SC) FROM: Boring 9 @ 6"–5'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.

21–2–272	Kumar & Associates	GRADATION TEST RESULTS	Fig. 9

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Kumar and Associates, Inc.

TABLE I

SUMMARY OF LABORATORY TEST RESULTS

Project No.: 212-272
Project Name: Constitution Self Storage
Date Sampled: 1/14/2022
Date Received: 1/19/2022

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	AASHTO CLASSIFICATION (Group Index)	SOIL OR BEDROCK TYPE (Unified Soil Classification)
BORING	DEPTH (ft)				GRAVEL (%)	SAND (%)		LIQUID LIMIT	PLASTICITY INDEX			
1	2	1/25/22	12.0	85.4			64	40	18		A-6 (10)	Sandy Lean Clay (CL)
2	4	1/25/22	7.0	98.0	0	37	63	36	14		A-6 (7)	Sandy Lean Clay (CL)
3	4	1/25/22	4.2	89.6	0	83	17		NP		A-2-4 (0)	Fill: Silty Sand (SM)
4	2	1/25/22	6.5	109.3	0	76	24	25	5		A-2-4 (0)	Silty Clayey Sand (SC-SM)
5	9	1/25/22	6.4	103.3	0	70	30	28	10		A-2-4 (0)	Clayey Sand (SC)
6	4	1/25/22	10.5	103.0	0	45	55	41	22	<0.01	A-7-6 (9)	Sandy Lean Clay (CL)
7	9	1/25/22	6.4	98.0	0	57	43	28	9		A-4 (1)	Clayey Sand (SC)
8	4	1/25/22	5.0	123.0			32	29	13		A-2-6 (1)	Fill: Clayey Sand (SC)
9	6"-5'	1/25/22			3	66	31	33	16		A-2-6 (1)	Fill: Clayey Sand (SC)
9	2	1/25/22	5.1	105.8								Fill: Clayey Sand (SC)

Kumar & Associates, Inc.®
Geotechnical and Materials Engineers
and Environmental Scientists

An Employee Owned Company

6735 Kumar Heights
Colorado Springs, CO 80918
phone: (719) 632-7009
fax: (719) 632-1049
email: kacolospgs@kumarusa.com
www.kumarusa.com

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado

March 22, 2022

Johnson Development Associates, Inc.
Attn: Mr. Brian Kearney
2259 Campus Drive
El Segundo, CA 90245

bkearney@johnsondevelopment.net

Subject: Geotechnical Engineering Report Addendum, Proposed Self Storage Facility, 6855 Constitution Avenue, Colorado Springs, Colorado.

Project No. 21-2-272

Dear Mr. Kearney:

As requested, this letter provides supplemental recommendations for the subject project, based on our understanding of changes in the proposed construction. We previously prepared a geotechnical engineering report for the development, Project No. 21-2-272, dated February 3, 2022. At the time of the original study, the proposed construction was to consist of a single-story building with a footprint of roughly 100,800 SF. We understand the current proposed building will be two-story and have a reduced footprint of approximately 54,800 SF. The first floor of the building will have a finished floor elevation of 6,510.1 feet, which will result in a retaining condition within the foundation walls along the west and north sides of the building of approximately 6 feet or less.

Based on our review of the project geotechnical engineering report and our current understanding of the proposed construction, it is our opinion the recommendations presented in the February 2022 report remain applicable for this project. Because portions of the building will now have adjacent exterior grades higher than the interior floor elevation, we recommend the west and north sides of the building be protected by a partial perimeter underdrain. Although shallow groundwater was not encountered, our experience indicates localized perched water conditions can develop after development, particularly in wetter seasons, and after precipitation events.

The underdrain system should consist of drain lines along the west and north sides of the building (interior or exterior) where exterior grades will be greater than the first floor elevation. The drain lines should extend a minimum of 2 feet below the first floor slab elevation, with a minimum 4-inch diameter, perforated rigid pipe placed in the bottom of a trench, and surrounded above the invert level with free-draining gravel. This free-draining gravel should be surrounded with an unwoven filter fabric (Mirafi 140N or equivalent). If the drain is installed on the building interior, the gravel should extend up to the slab bearing elevation. If installed on the exterior, the gravel should extend to a minimum 1 foot above the drain pipe. Free-draining gravel used in the drain system should contain less than 5% passing the No. 200 sieve, less than 30% passing the No. 4 sieve and have a maximum size of 2 inches. The drain lines should be graded to a gravity outlet or sump at a minimum 1% slope.

If you should require any further information, please feel free to contact our office.

Sincerely,

Kumar & Associates, Inc.
By: Duane P. Craft, PE

COLORADO REGISTERED PROFESSIONAL ENGINEER
DUANE P. CRAFT
37553
3/22/22

DPC:th
Rev by AFK

Kumar & Associates, Inc.®
Geotechnical and Materials Engineers
and Environmental Scientists

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6735 Kumar Heights
Colorado Springs, CO 80918
phone: (719) 632-7009
fax: (719) 632-1049
email: kacolospgs@kumarusa.com
www.kumarusa.com

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado

February 16, 2023

Johnson Development Associates, Inc.
Attn: Mr. Brian Duncan
101 N. Pacific Coast Hwy, Suite 308
El Segundo, CA 90245

bduncan@johnsondevelopment.net

Subject: Geotechnical Engineering Report Addendum No. 2, Proposed Detention Pond Structures, Self-Storage Facility Project, 6855 Constitution Avenue, Colorado Springs, Colorado.

Project No. 21-2-272.A

Dear Mr. Duncan:

As requested, this letter provides supplemental recommendations for the subject project, to incorporate recommendations associated with planned detention pond structures that will be constructed east of the proposed self-storage facility. We previously prepared a geotechnical engineering report for the development, Project No. 21-2-272, dated February 3, 2022. We also provided a report addendum letter dated March 22, 2022 to reflect changes to the building pad size and planned grading.

Proposed Construction: We understand the proposed detention pond will be outlined with cantilevered cast-in-place concrete retaining walls around the pond perimeter, and will include two concrete inlet forebays with trickle channels that connect to a concrete micro pool and outlet. The retaining walls will have a maximum height of about 9 feet. The pond will include an aggregate surfaced maintenance road that ramps into the pond basin along the western side. Our project understanding is based on the Private Permanent Control Measure Plan and Site Development Plan Civil drawings, dated December 2022, that were provided to us.

Subsurface Conditions: Referencing our February 2022 study, Borings 1, 2 and 3 were drilled in the vicinity of the proposed pond. Under a layer of topsoil, Borings 1 and 2 encountered approximately 3 to 5 feet of native sandy lean clay, followed by granular soils, to include silty sand, clayey sand, and silty-clayey sand which extended to the 20-foot depth explored. Boring 3 included approximately 5 feet of silty to clayey sand fill, followed by native granular soil types of similar composition to the 20-foot depth explored. Groundwater was not encountered at the time of drilling.

Detention Pond Structure Foundations: Based on our review of the project geotechnical engineering report and our current understanding of the proposed construction, it is our opinion the spread footing foundation recommendations and associated criteria presented in the February 2022 report for the proposed building will be applicable for the detention pond structures, with the exception of the recommended allowable bearing capacity. We recommend a reduced allowable soil bearing pressure of 1,500 psf be used for design of the pond structure foundations due to the anticipated subsurface water conditions during use.

Retaining Structures: The "Foundation Walls and Retaining Structures" section of our February 2022 report should be amended with the following criteria, which has been expanded to include at-rest and undrained parameters.

Foundation walls and other earth retaining structures should be designed for the lateral earth pressure generated by the backfill. The lateral earth pressure acting on a wall is a function of the degree of rigidity of the retaining structure and the type of material used as backfill. Rigid earth retaining structures which are restrained from lateral deflection should be designed for the at-rest earth pressure condition. Cantilevered retaining structures capable of deflecting under loads will allow mobilization of the shear strength of the backfill and may be designed for the reduced lateral earth pressure represented by the active earth pressure condition. We recommend the earth retaining structures be designed for lateral earth pressures computed using the parameters from the following tabulation.

Application	Values Based on On-Site Granular Soils		Values Based on Import CDOT Class I Granular Backfill Material	
	Drained	Undrained	Drained	Undrained
Active Condition Equivalent Fluid Unit Weight	45 pcf	83 pcf	40 pcf	81 pcf
At-Rest Condition Equivalent Fluid Unit Weight	65 pcf	93 pcf	60 pcf	91 pcf

All foundation and retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent buildings, traffic, construction materials and equipment. The pressures recommended above assume a horizontal backfill surface above the groundwater table. An upward sloping backfill surface or undrained conditions will increase the lateral pressure imposed on a foundation wall or retaining structure.

The lateral resistance of a foundation or retaining wall footing placed on undisturbed native granular soils or properly compacted structural fill material will be a combination of the sliding resistance of the foundation on the foundation materials and passive earth pressure against the side of the footing. Resistance to sliding at the bottoms of the footings may be calculated based on an allowable coefficient of friction of 0.3. Passive pressure against the sides of the footings may be calculated using an allowable equivalent fluid unit weight of 180 pcf. If undrained conditions are assumed for the design, an equivalent fluid unit weight of 110 pcf should be used.

The onsite soils, minus any clay, are suitable for use as wall backfill. Imported granular wall back fill, if used, should meet the requirements of a CDOT Class I structural backfill with less than 20% passing the No. 200 sieve. Proposed material should be approved by the geotechnical engineer prior to use.

The granular backfill behind foundation and retaining walls should be sloped from the base of the wall at an angle of at least 45 degrees from the vertical. Backfill should be placed in uniform lifts and compacted to the criteria presented below. Care should be taken not to overcompact the backfill since this could cause excessive lateral pressure on the walls. Some settlement of deep foundation wall backfills will occur even if the material is placed properly.

Subgrade Preparation and Compaction Criteria: We recommend the subgrade of the proposed forebays, outlet structures, trickle channels and retaining walls be prepared in the same manner as recommended for the building foundation in our 2022 report. Overexcavation and replacement of all existing fill will be required where present below the bearing elevation. Additionally, overexcavation and replacement of the clay soils will be required where encountered within 3 feet of the bearing elevation. The "Foundation Recommendations – Spread Footings" and "Site Grading and Earthwork" sections of the February 2022 report should be consulted for additional criteria. The compaction requirements table below (from the 2022 report) has been amended to include the detention pond structures.

Area	Percentage of Standard Proctor Maximum Dry Density (ASTM D 698)
Building Pad and Detention Pond Structures	98%
Floor Slab Subgrade	95%
Foundation Wall Backfill	95%
Beneath Pavement Areas/Exterior Flatwork/Utility Trenches	95%
Retaining Wall Subgrade	98%
Retaining Wall Backfill	95%
Landscape and Other Misc. Overlot Fill Areas	95%
Compaction of granular soils should be achieved at a moisture content within +/- 2% of the optimum. Clay materials should be placed at a moisture content within -1% to +3% of the optimum.	

If you should require any further information, please feel free to contact our office.

Sincerely,

Kumar & Associates, Inc.
By: Duane P. Craft, PE

DPC:sw
Rev by AFK

Kumar & Associates, Inc.®
Geotechnical and Materials Engineers
and Environmental Scientists

2390 South Lipan Street
Denver, CO 80223
phone: (303) 742-9700
fax: (303) 742-9666
email: kadenver@kumarusa.com
www.kumarusa.com

An Employee Owned Company

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado

February 24, 2023

Johnson Development Associates, Inc.
Attn: Brian Duncan
101 North Pacific Highway, Suite 308
El Segundo, California 90245

Subject: Evaluation of Global Slope Stability for Private Permanent Control Measure Structure, Constitution Avenue, 6855 Constitution Avenue, Colorado Springs, Colorado

Project No. 21-2-272A

Dear Mr. Duncan:

This letter summarizes our evaluation of global stability of the proposed retaining structures associated with the proposed private permanent control measure structure to be constructed at 6855 Constitution Avenue in Colorado Springs, Colorado.

Proposed Construction: Based on the information provided, we understand a permanent control measure structure will be constructed east of the proposed storage facility to be located at the subject address. The proposed construction will consist of a detention pond outlined with cantilevered cast-in-place concrete retaining walls around the pond perimeter, and will include two concrete inlet forebays with trickle channels connecting to a concrete micro pool and outlet. Based on the plans provided, the concrete retaining walls will have a maximum height approaching about 9 feet. The pond will include an aggregate-surfaced maintenance road that ramps into the pond basin along the western side. Our understanding of the proposed construction is based on review of the plans provided; "Private Permanent Control Measure Plan, Constitution Storage (Project Plans)," dated December 2022. The Project Plans are attached to this letter.

Project History: Kumar & Associates, Inc. (K+A) previously performed a geotechnical engineering study for the project with the results presented in a report to Johnson Development Associates, Inc. under our Project No. 21-2-272, dated February 3, 2022. Two addendums to the report were subsequently prepared and were dated March 22, 2022 and February 16, 2023.

Since the submission of our geotechnical engineering report and associated addendums, we have been retained to perform global stability analysis of the retaining structures associated with the proposed private permanent control measure structure.

Global Stability Analyses: The global slope stability of the proposed retaining structures were evaluated using the Slope/W module of the Geostudio 2021 computer program. Several sections of the retaining structures were modeled and analyzed for global stability. The geometry of the selected sections were modeled based on the Project Plans provided. The soil conditions below and behind the retaining structures were based on the subsurface conditions encountered in the borings drilled in the area of the proposed permanent control measure structure as part of our project geotechnical engineering study as well as the information presented in the Project Plans. A maximum piezometric surface at an elevation of 6503.1 feet was selected and used in the analyses based on the emergency overflow elevation shown on Sheet PCM1.3 of the Project Plans.

Soil parameters consisting of unit weight, internal friction angle (phi angle), and cohesion for the soils and materials to be used for the construction of the facility were selected based on the laboratory testing performed as part of our project geotechnical engineering study and our experience. The following table presents the soil properties selected for the stability analyses.

Material	Unit Weight (pcf)	Drained Shear Strengths	
		Ø (degrees)	c' (psf)
Aggregate Base Course	135	34	0
Concrete	145	n/a	n/a
Free-Draining Granular Fill	130	32	0
On-Site Granular Soils	120	28	0

Analyses Results: The minimum factor of safety (FOS) as generally accepted in the local geotechnical practice for a permanent retaining structure is 1.5. Based on our analyses, the calculated critical FOS for global stability was about 1.7 at Station 1+50. Our analyses indicated FOS values above 1.5 for each of the seven sections evaluated. The results of the global stability analyses are presented in Figs. GS1 through GS7.

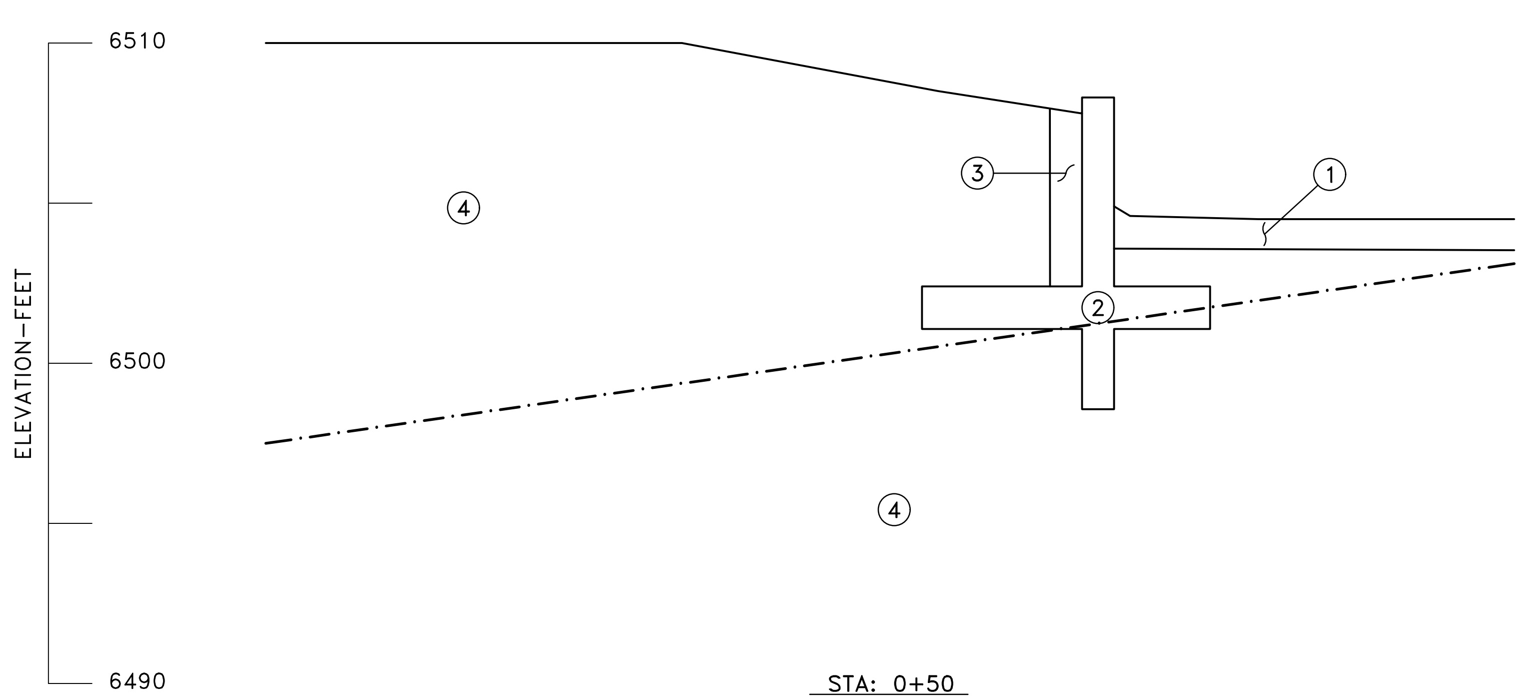
Limitations: This study has been performed in accordance with generally accepted geotechnical engineering practices in this area for exclusive use by the client. The conclusions submitted in this letter are based upon the information obtained during our project geotechnical engineering study and the Project Plans provided. This report may not reflect subsurface variations that occur below the depth observed, and the nature and extent of variations across the site may not become evident until additional site grading and excavations are performed. If during construction, fill, soil, rock, or water conditions appear to be different from those described herein, K+A should be advised at once so a re-evaluation of the design can be made. K+A is not responsible for liability associated with interpretation of subsurface data by others. K+A has not evaluated the internal or external stability of the walls which were performed by others. Additionally, were understand the retaining structures were designed by Galloway & Company, Inc.

If you have any questions, please contact us.

Sincerely,

KUMAR & ASSOCIATES, INC.
Justin Cupich, P.E.

JDC/mr
REV: DPC
Attachments

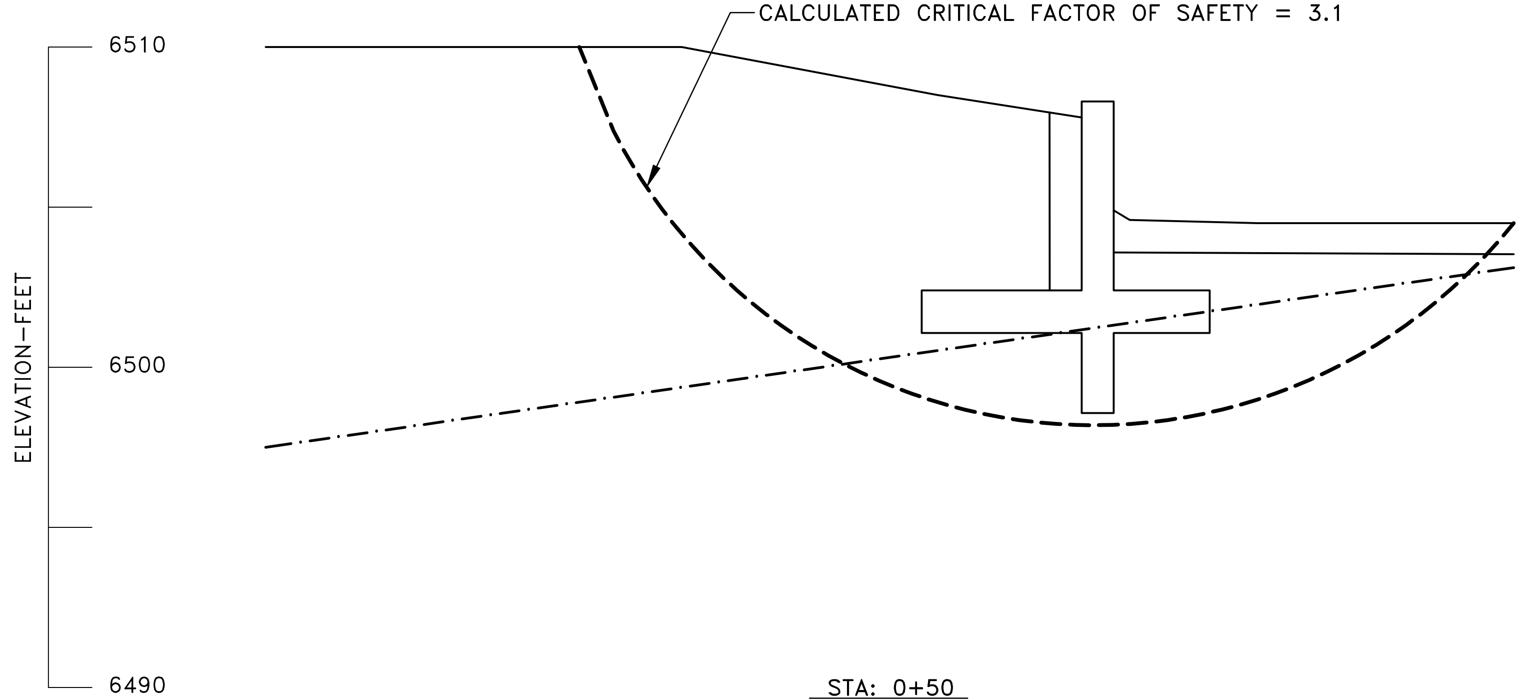


MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			ϕ (DEG.)	COHESION (PSF)
1	AGGREGATE BASE COURSE	135	34	0
2	CONCRETE	145	N/A	N/A
3	FREE–DRAINING GRANULAR FILL	130	32	0
4	ON–SITE GRANULAR SOILS	120	28	0

LEGEND:

—·—·—·— PIEZOMETRIC SURFACE.



21–2–272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS1

February 24, 2023 – 10:02am
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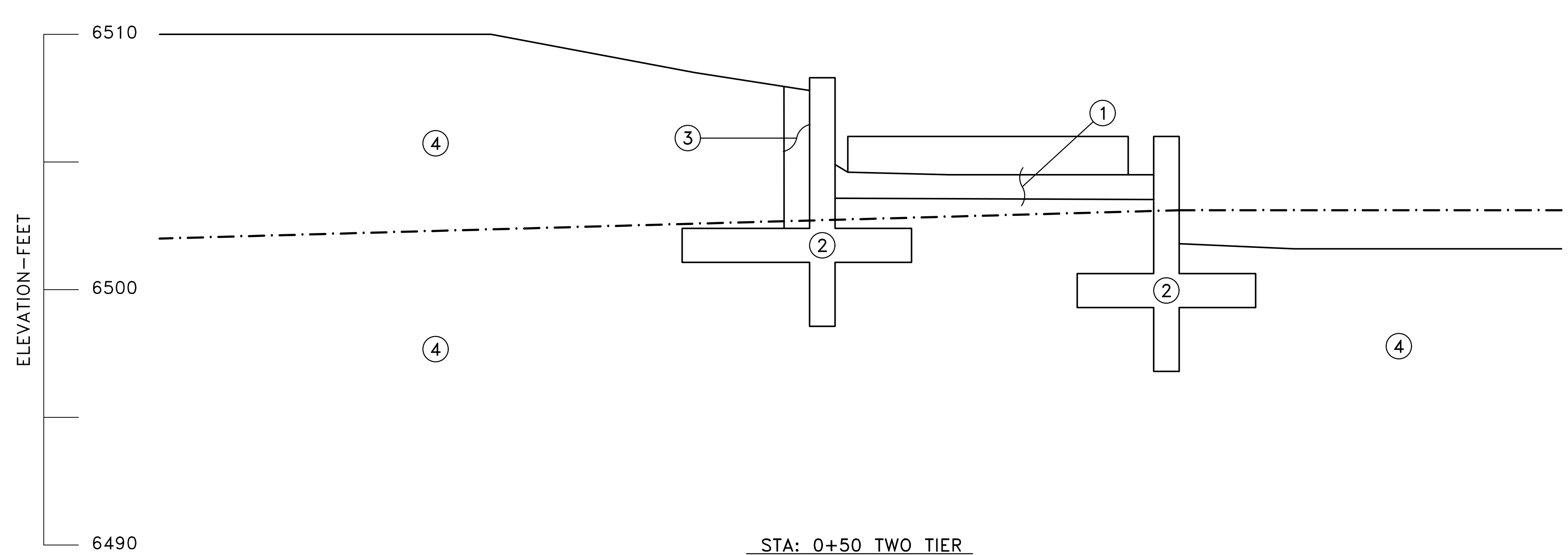


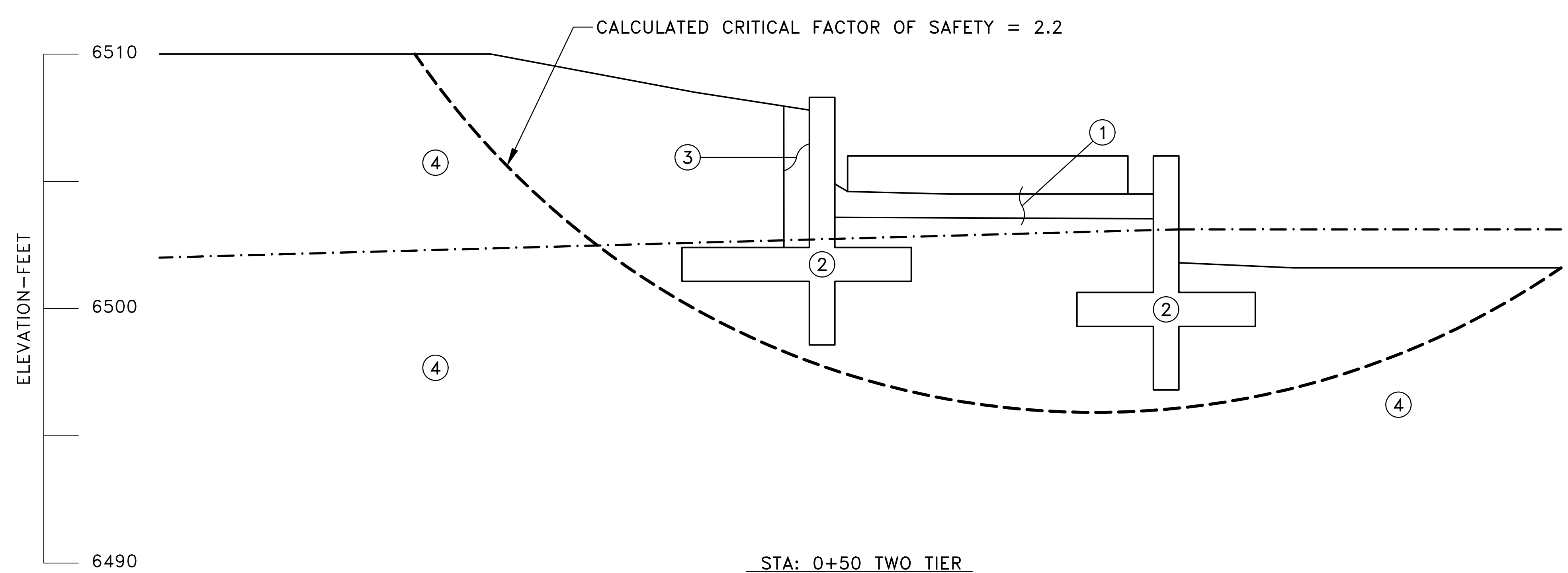
STA: 0+50 TWO TIER

MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			φ (DEG.)	COHESION (PSF)
1	AGGREGATE BASE COURSE	135	34	0
2	CONCRETE	145	N/A	N/A
3	FREE—DRAINING GRANULAR FILL	130	32	0
4	ON—SITE GRANULAR SOILS	120	28	0

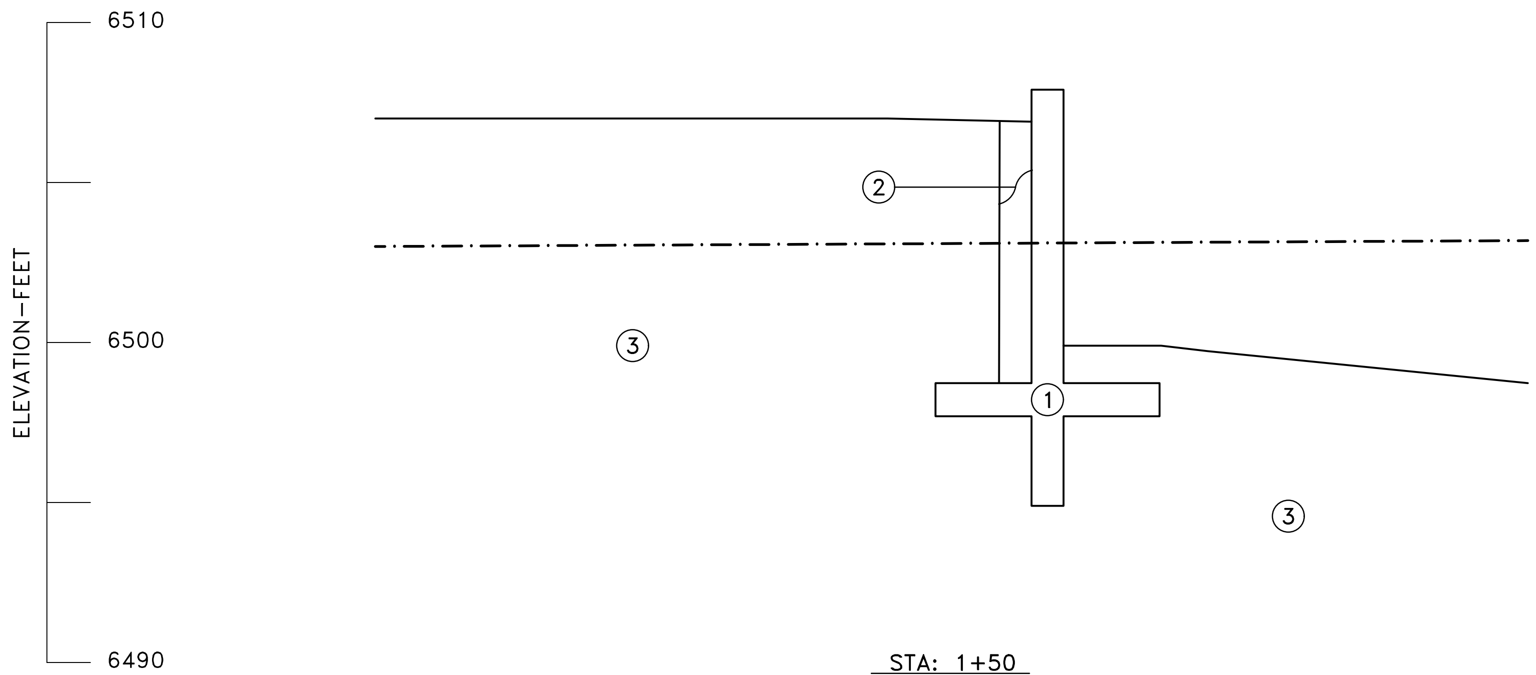
LEGEND:

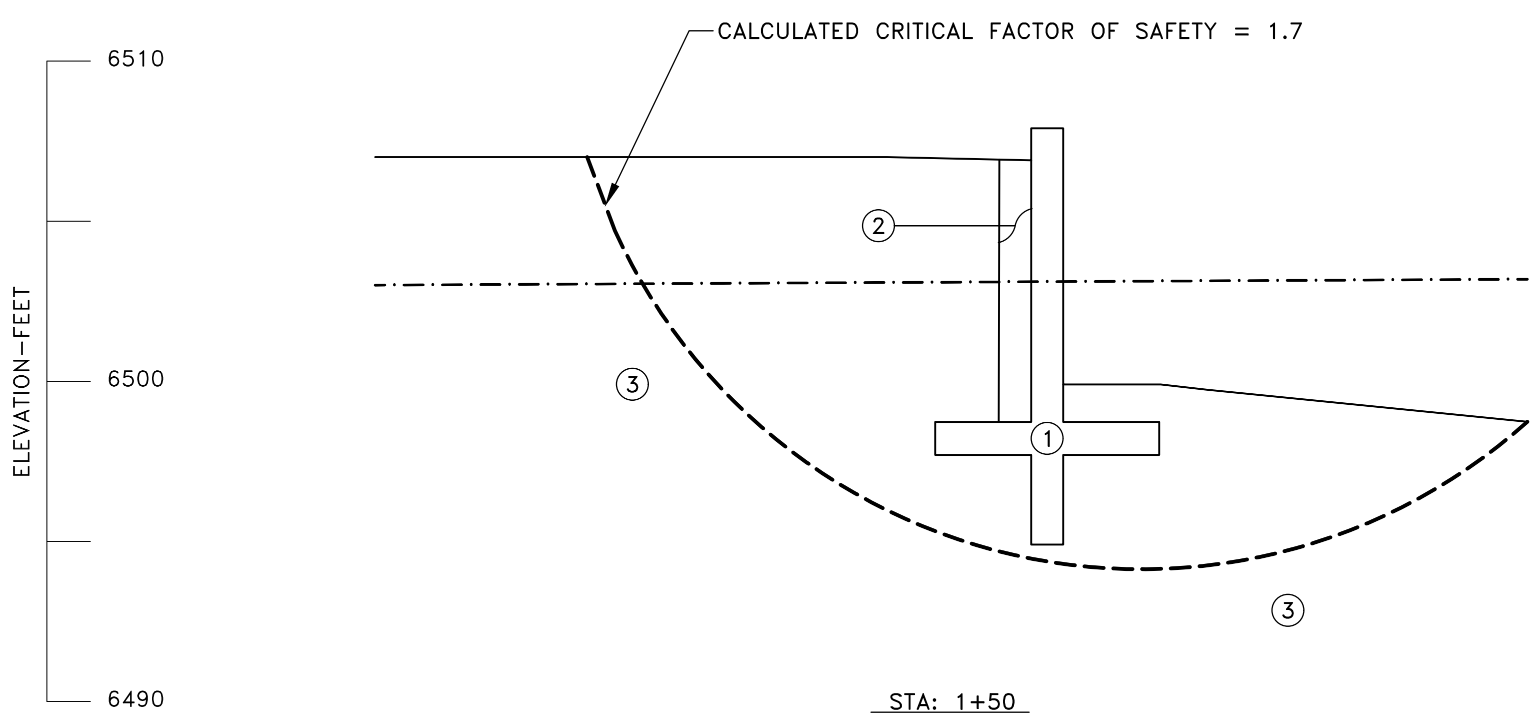
—·—·—·— PIEZOMETRIC SURFACE.



STA: 0+50 TWO TIER

21—2—272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS2





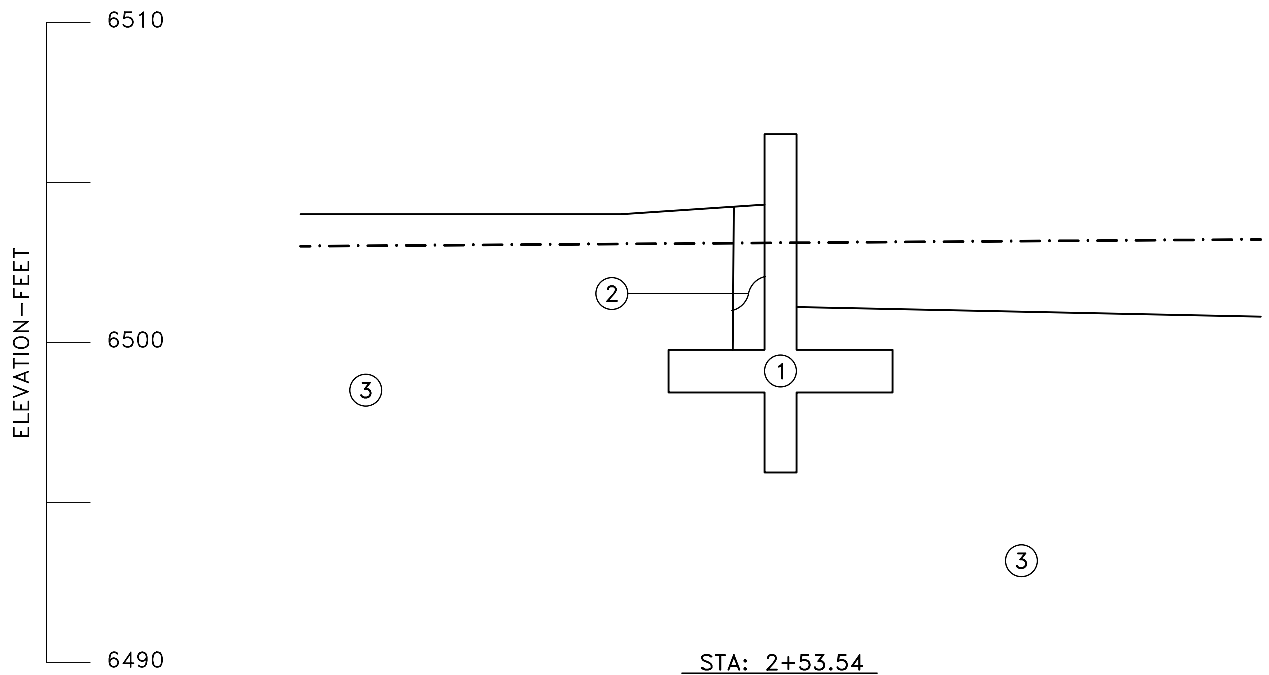
MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

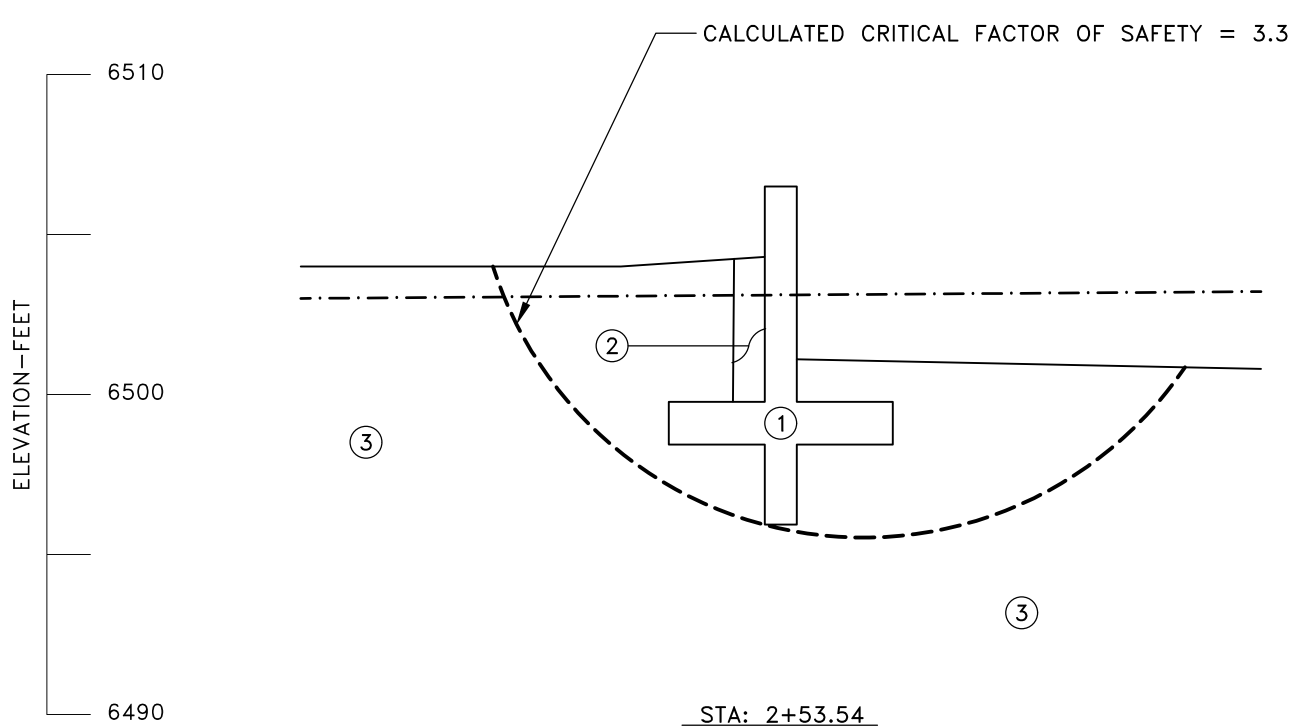
MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			ϕ (DEG.)	COHESION (PSF)
1	CONCRETE	145	N/A	N/A
2	FREE–DRAINING GRANULAR FILL	130	32	0
3	ON–SITE GRANULAR SOILS	120	28	0

LEGEND:

—·—·—·— PIEZOMETRIC SURFACE.

21–2–272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS3





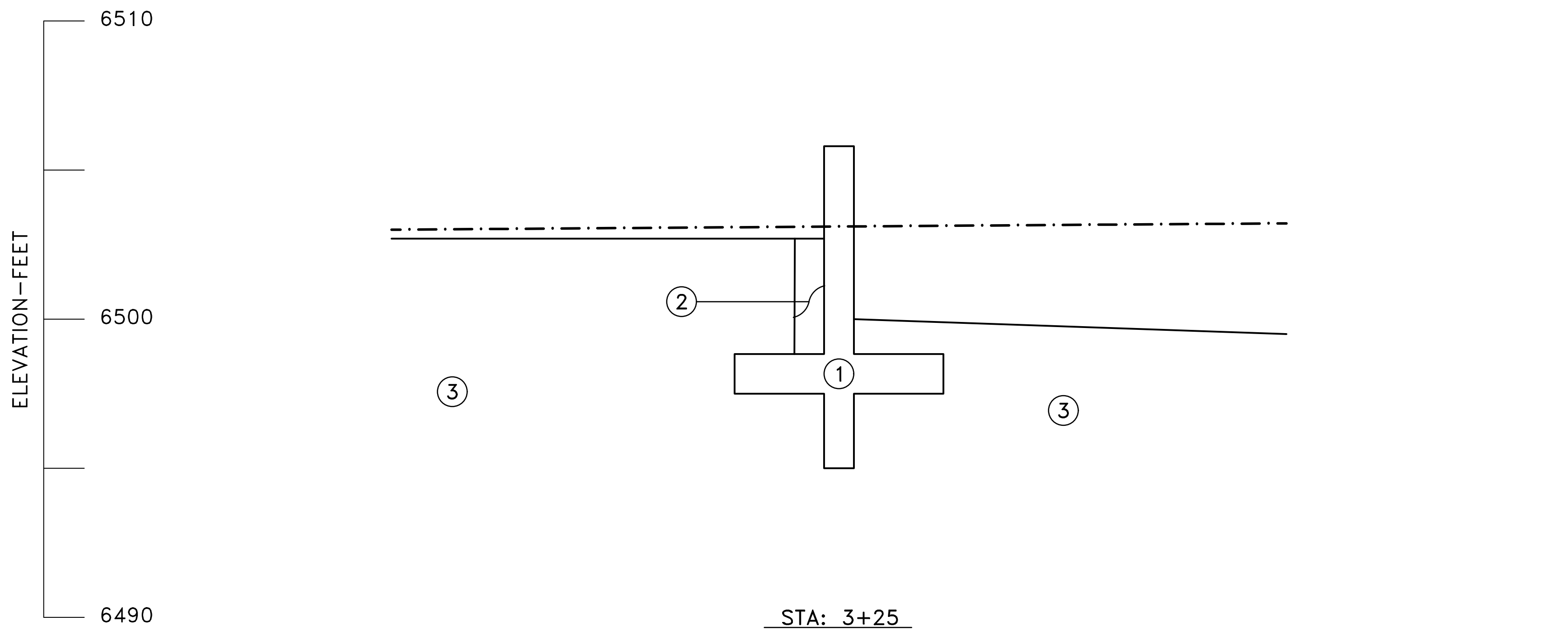
MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

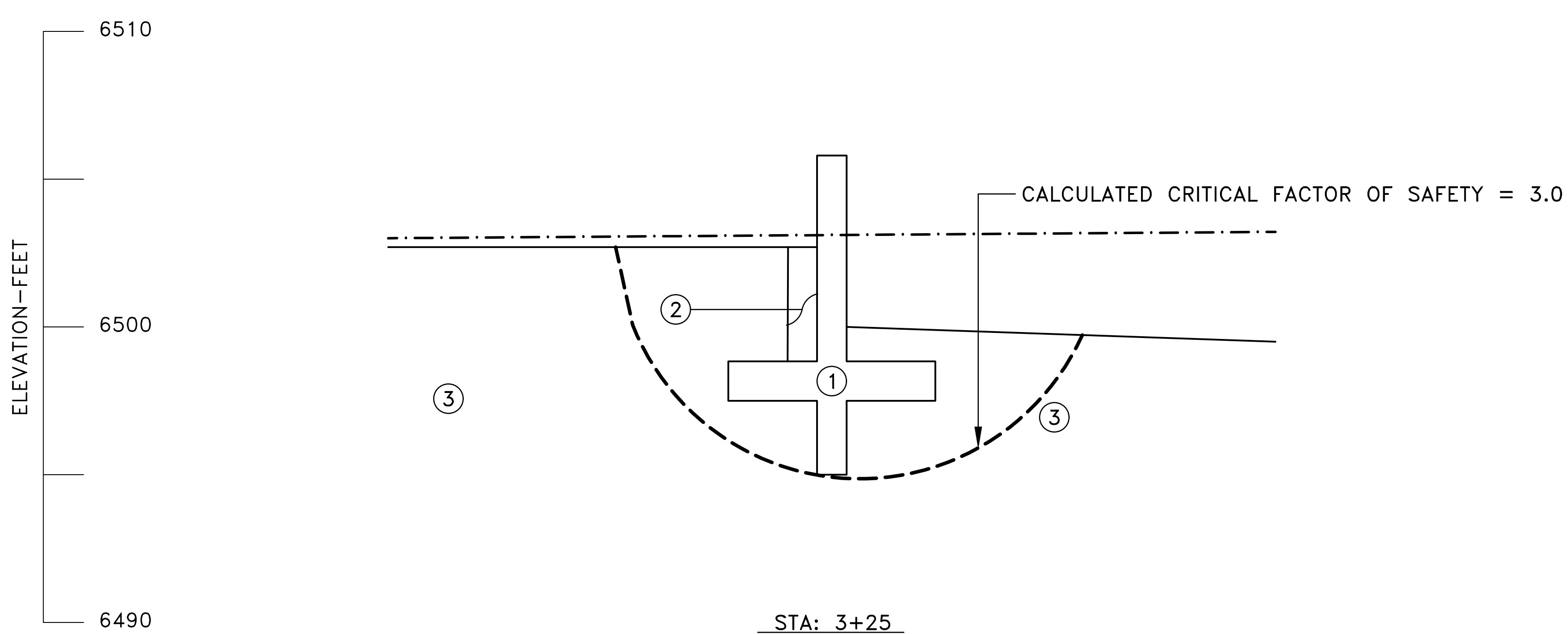
MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			φ (DEG.)	COHESION (PSF)
①	CONCRETE	145	N/A	N/A
②	FREE–DRAINING GRANULAR FILL	130	32	0
③	ON–SITE GRANULAR SOILS	120	28	0

LEGEND:

—·—·—·— PIEZOMETRIC SURFACE.

21–2–272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS4





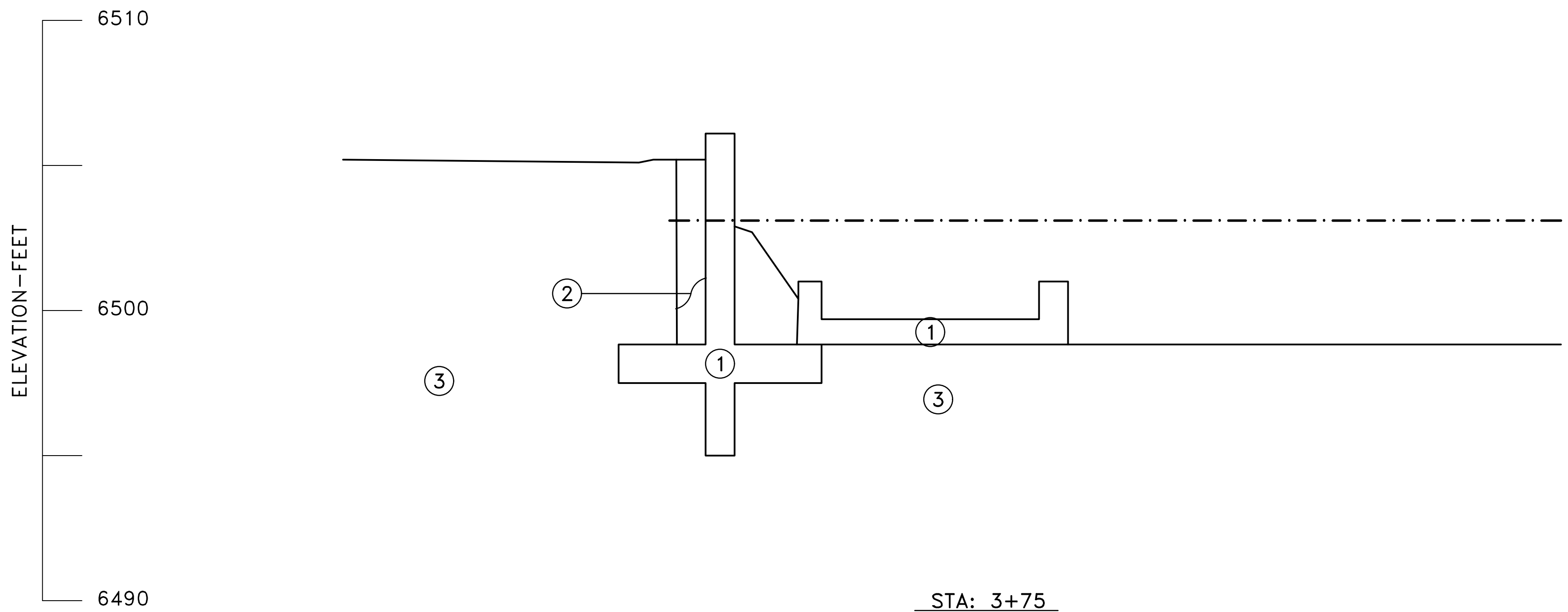
MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			φ (DEG.)	COHESION (PSF)
1	CONCRETE	145	N/A	N/A
2	FREE–DRAINING GRANULAR FILL	130	32	0
3	ON–SITE GRANULAR SOILS	120	28	0

LEGEND:

—·—·—·—·— PIEZOMETRIC SURFACE.

21–2–272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS5



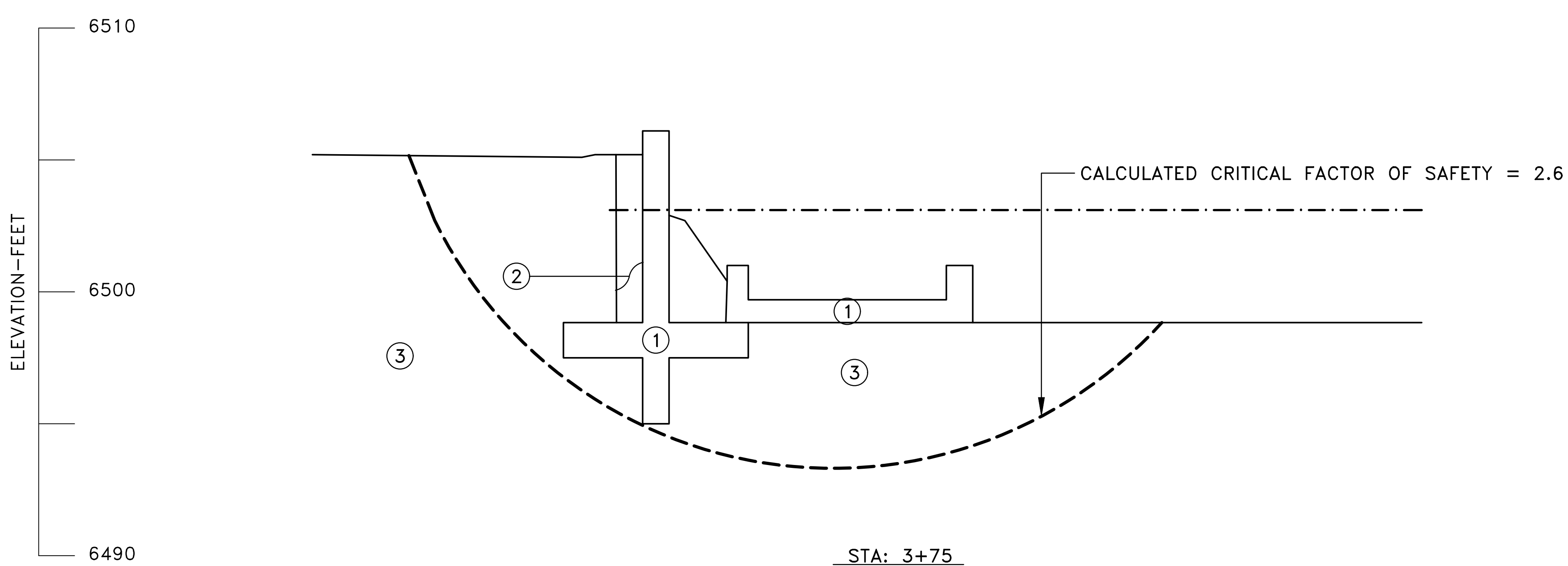
STA: 3+75

MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			ϕ (DEG.)	COHESION (PSF)
1	CONCRETE	145	N/A	N/A
2	FREE—DRAINING GRANULAR FILL	130	32	0
3	ON—SITE GRANULAR SOILS	120	28	0

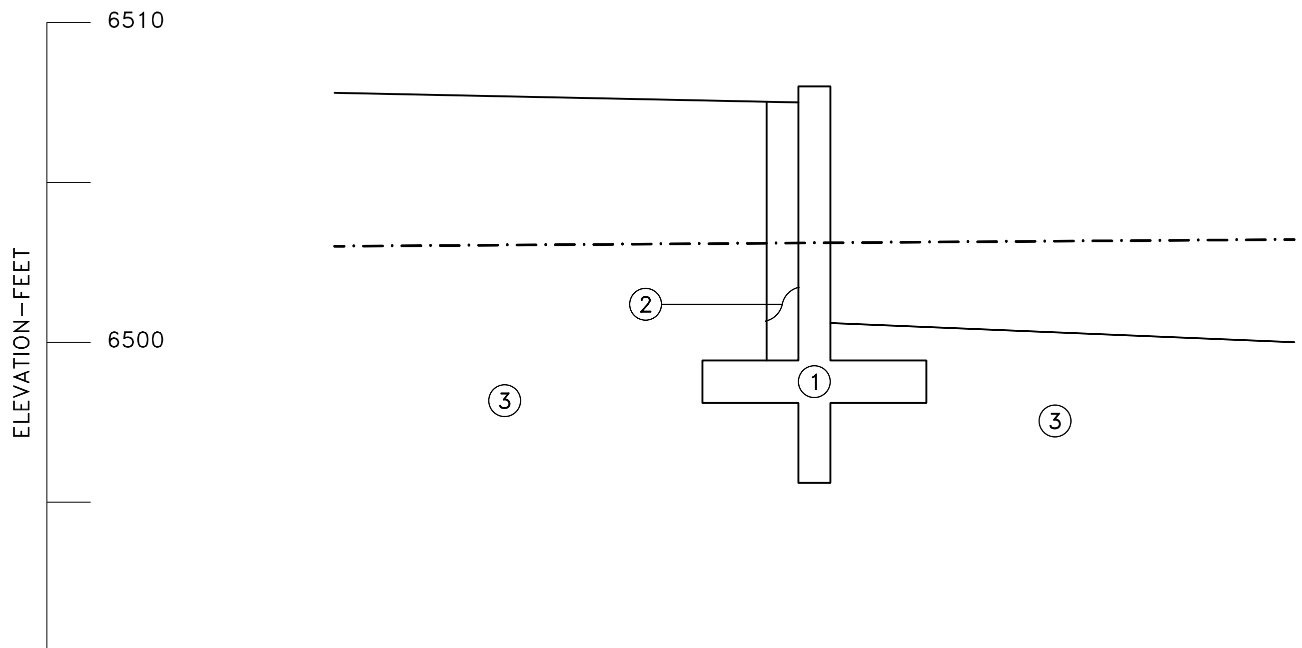
LEGEND:

—·—·—·— PIEZOMETRIC SURFACE.



STA: 3+75

21—2—272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS6



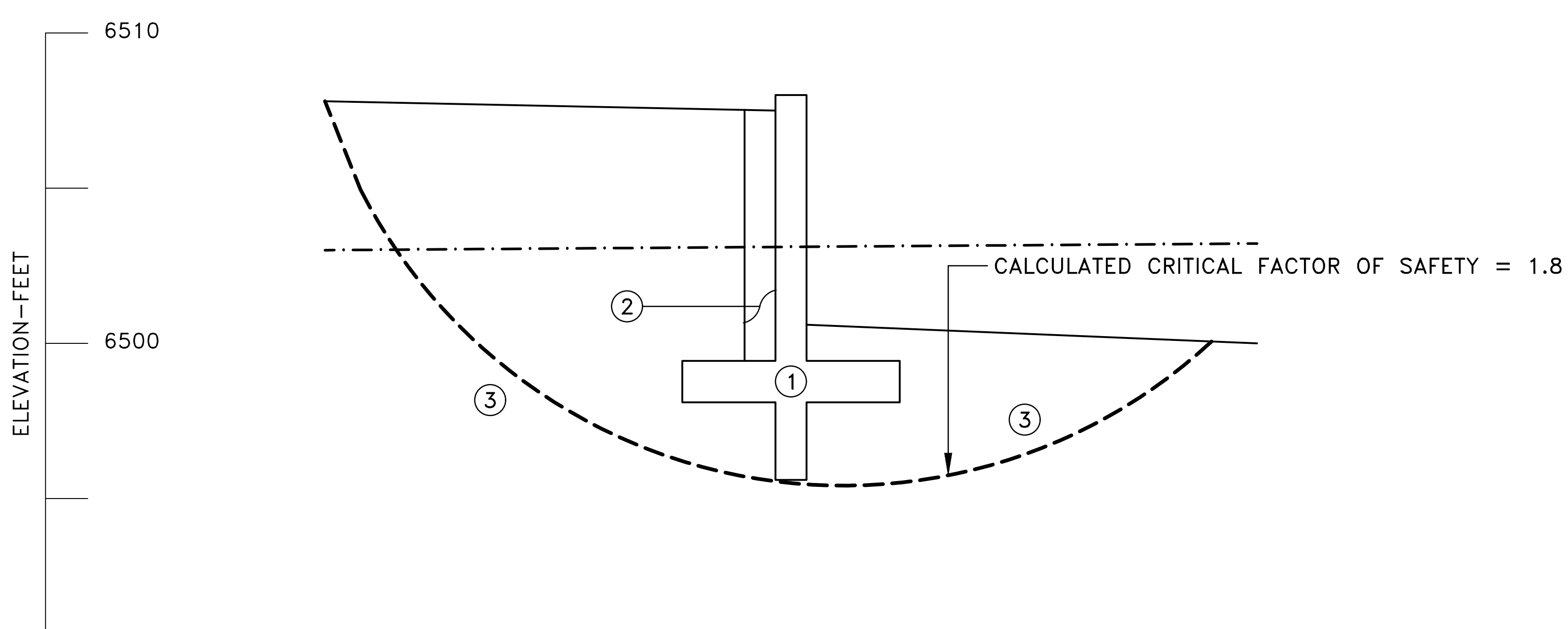
STA: 4+00

MATERIAL UNIT WEIGHTS AND SHEAR STRENGTHS

MATERIAL NO.	MATERIAL	UNIT WEIGHT (PCF)	DRAINED SHEAR STRENGTHS	
			ϕ (DEG.)	COHESION (PSF)
1	CONCRETE	145	N/A	N/A
2	FREE-DRAINING GRANULAR FILL	130	32	0
3	ON-SITE GRANULAR SOILS	120	28	0

LEGEND:

—·—·—·— PIEZOMETRIC SURFACE.



STA: 4+00

21-2-272A	Kumar & Associates	CONSTITUTION AVENUE STORAGE, COLORADO SPRINGS, COLORADO	GLOBAL STABILITY	Fig. GS7

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PRIVATE PERMANENT CONTROL MEASURE PLANS

JOHNSON DEVELOPMENT ASSOCIATES

CONSTITUTION STORAGE

LOT 1, EIGHT LINE SUBDIVISION LOCATED IN THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

PERMANENT CONTROL MEASURE PLAN

PROJECT CONTACTS

PROPERTY OWNER
JASPERCO, LLC.
5532 SADDLE ROCK TRAIL
COLORADO SPRINGS, CO 80918
ATTN: TONY COLON
EMAIL: TONYC@COLONFAM.COM

APPLICANT
JOHNSON DEVELOPMENT ASSOCIATES, INC.
100 DUNBAR STREET, SUITE 400
SPARTANBURG, SC 29306
TELE: (864) 529-1297
ATTN: BRIAN KEARNEY
EMAIL: BKEARNEY@JOHNSONDEVELOPMENT.NET

CIVIL ENGINEER
GALLOWAY & CO., INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, CO 80920
TELE: (719) 900-7220
ATTN: GRANT DENNIS, P.E.
EMAIL: GRANTDENNIS@GALLOWAYUS.COM

GEOTECHNICAL ENGINEER
ROCKY MOUNTAIN GEOTECHNICAL, INC
555 E. PIKES PEAK AVE, SUITE 107
COLORADO SPRINGS, CO 80903
TELE: (303) 634-1999
ATTN: KENNETH L. MEYERS, PE

TRAFFIC ENGINEER
GALLOWAY & CO., INC.
5500 GREENWOOD PLAZA BLVD, SUITE 200
GREENWOOD VILLAGE, CO 80111
TELE: (303) 770-8884
ATTN: BRIAN HORAN, P.E.
EMAIL: BRIANHORAN@GALLOWAYUS.COM

SURVEYOR
GALLOWAY & CO., INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, CO 80920
TELE: (719) 337-1262
ATTN: BRIAN DENNIS
EMAIL: BRIANDENNIS@GALLOWAYUS.COM

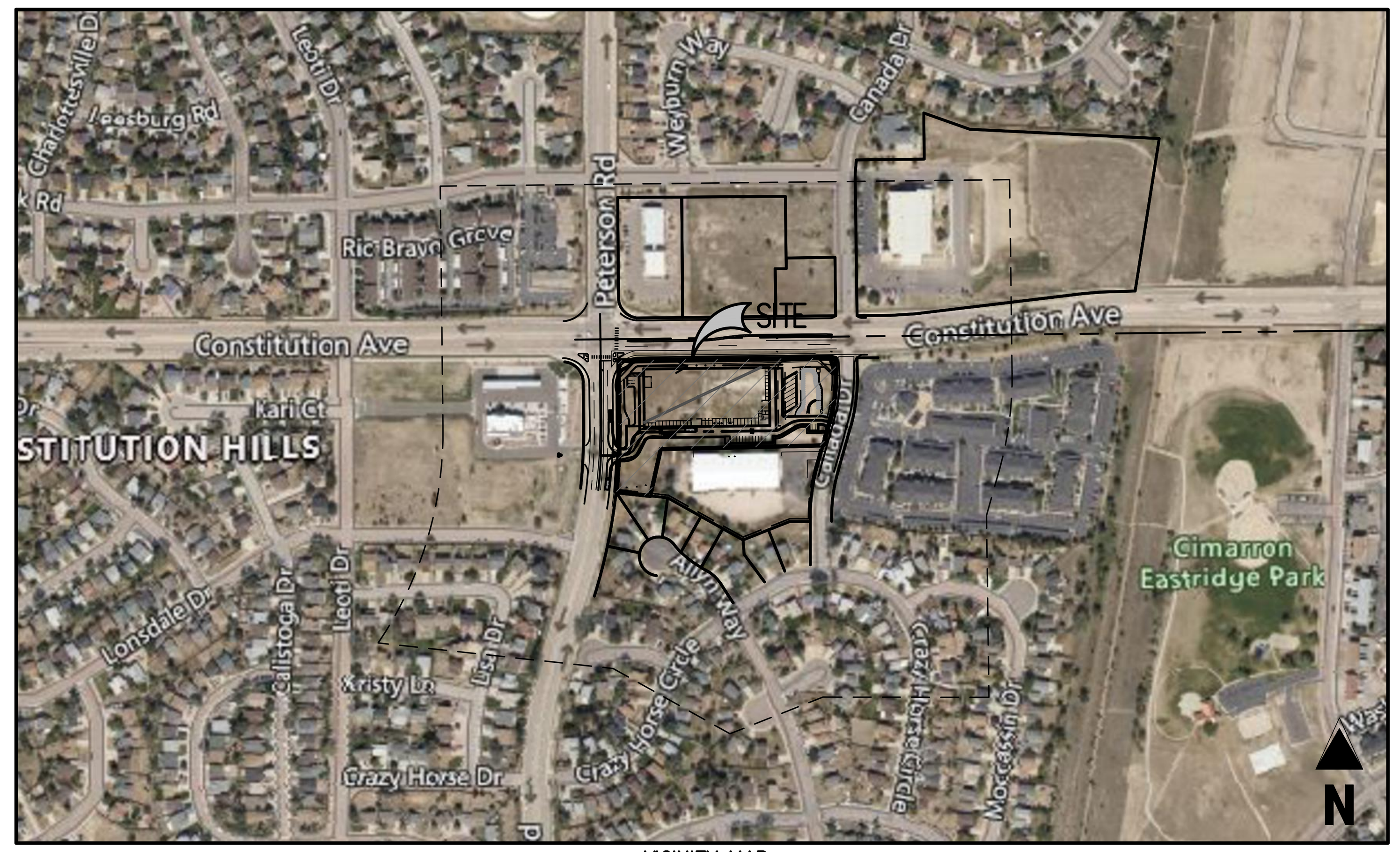
UTILITY CONTACTS

WATER & WASTEWATER
CHEROKEE METROPOLITAN DISTRICT
6250 PALMER PARK BLVD.
COLORADO SPRINGS, CO 80915
TELE: (719) 597-5080
ATTN: KEVIN BROWN
EMAIL: KBROWN@CHEROKEEMETROPOLITAN.ORG

ELECTRIC
MOUNTAIN VIEW ELECRIC
11140 E WOODMEN RD
FALCON, CO 80831
TELE: (719) 495-2283
CATHY HANSEN-LEE
EMAIL: CATHY.H@MVEA.COOP

NATURAL GAS
COLORADO SPRINGS UTILITIES (CSU)
7710 DURANT DRIVE, P.O. BOX 1103, MAIL CODE 2150
COLORADO SPRINGS, CO 80947-2150
TELE: (719) 668-5573
AARON CASSIO
EMAIL: ACASSIO@CSU.ORG

FIRE
CIMARRON HILLS FIRE PROTECTION DISTRICT
1835 TUSKEGEE PL
COLORADO SPRINGS, CO 80915
TELE: (719) 591-0960
EMAIL: JMCLEOD@CIMARRON



VICINITY MAP
0 100 200 400
SCALE: 1"=400'

SHEET INDEX

SHEET NUMBER	SHEET DESCRIPTION	SHEET TITLE
PCM0.0	1	COVER SHEET
PCM1.0	2	OVERALL PCM PLAN
PCM1.1	3	POND PLAN
PCM1.2	4	FOREBAY DETAILS
PCM1.3	5	MICROPOOL DETAILS
PCM1.4	6	RETAINING WALL DETAILS

LEGAL DESCRIPTION
LOT 1, EIGHT LINE SUBDIVISION LOCATED IN THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO.

BASIS OF BEARINGS
BASIS OF BEARING: ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST BEARS N89°20'41"E, MONUMENTED BY THE NORTHWEST CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 4842 1985" IN RANGE BOX, AND BY THE NORTH QUARTER CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 30829 2003", AS SHOWN HEREON.

BENCHMARK
COLORADO SPRINGS UTILITIES FACILITIES INFORMATION MANAGEMENT SYSTEM (FIMS) BENCHMARK SR07 BEING A 2" ALUMINUM CAP STAMPED "CSU FIMS CONTROL SR07" AT THE SOUTHEAST CORNER OF THE CONCRETE BASE FOR AN ELECTRIC VAULT ON THE WEST SIDE OF PETERSON ROAD, ABOUT 360' SOUTH OF THE CENTER LINE OF LEOTI DRIVE.

FIMS DATUM ELEVATION = 6534.61

DESCRIPTION OF CONSTRUCTION ACTIVITIES
ALL DATES ARE SUBJECT TO CHANGE. CONSTRUCTION IS ANTICIPATED TO COMMENCE IN NOVEMBER OF 2021 AND BE COMPLETED BY MARCH OF 2022. FINAL STABILIZATION IS EXPECTED TO BE COMPLETED BY JULY OF 2022.

RECEIVING WATERS
INDIAN HILLS VILLAGE IS LOCATED WITHIN THE MESA DRAINAGE BASIN AS DESCRIBED IN THE "MASTER PLAN FOR MESA DRAINAGE BASIN," PREPARED BY GILBERT, MEYER & SAMS, INC. DATED AUGUST 10,1989.

STANDARD PCM NOTES

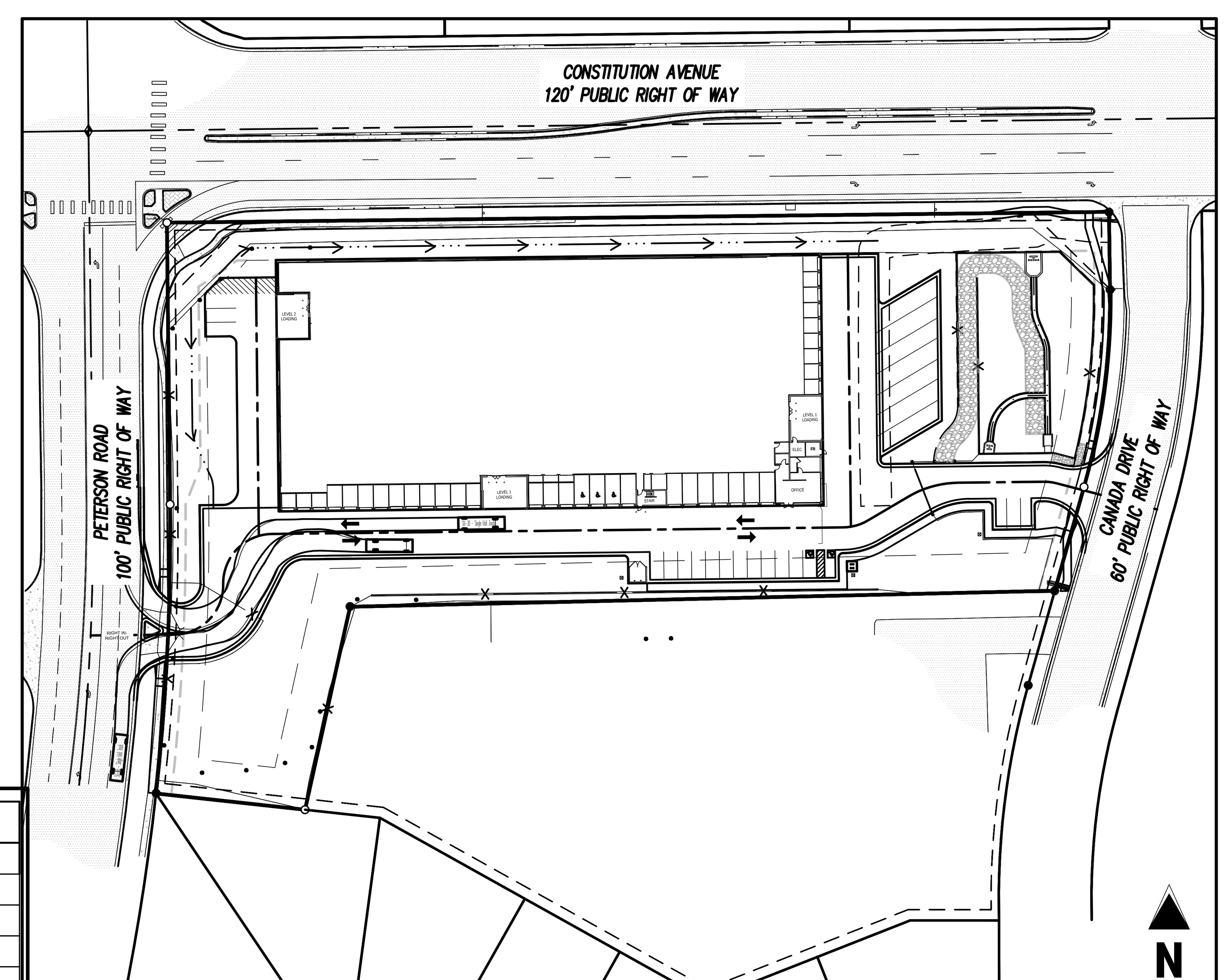
1. NO CLEARING, GRADING, EXCAVATION, FILLING, OR OTHER LAND DISTURBING ACTIVITIES SHALL BE PERMITTED PRIOR TO APPROVAL OF THE SITE GRADING AND EROSION CONTROL (GEC) PLAN. REFERENCE THE CITY OF COLORADO SPRINGS DRAINAGE CRITERIA MANUAL (DCM) VOLUME 2, CHAPTER 7 FOR MORE INFORMATION.
2. ANY LAND DISTURBANCE BY ANY OWNER, DEVELOPER, BUILDER, CONTRACTOR, OR OTHER PERSON SHALL COMPLY WITH THE POLICIES AND PROCEDURES OUTLINED IN THE CITY DCM, AND THE APPROVED GEC PLAN.
3. THIS PERMANENT BMP PLAN WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY THE CITY OF COLORADO SPRINGS IF WORK ON THE PERMANENT BMP DOES NOT COMMENCE WITHIN 12 MONTHS OF PLAN APPROVAL, OR SHOULD ANY OF THE FOLLOWING OCCUR: A CHANGE IN OWNERSHIP, A CHANGE IN THE PROPOSED DEVELOPMENT, OR CHANGES TO THE DESIGN OF THE BMP.
4. CONTACT CITY GEC INSPECTIONS, 719-385-5918, AND THE CITY ENGINEERING INSPECTIONS, 719-385-5977, AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
5. ACCEPTANCE OF THIS PLAN DOES NOT CONSTITUTE APPROVAL TO GRADE OR CAUSE ANY DISTURBANCE WITHIN ANY UTILITY EASEMENT OR RIGHT-OF-WAY. APPROVALS TO WORK WITHIN UTILITY EASEMENTS MUST BE OBTAINED FROM THE APPROPRIATE UTILITY COMPANY. IT IS NOT PERMISSIBLE FOR ANY PERSON TO MODIFY THE GRADE OF THE EARTH ON ANY UTILITY EASEMENT OF RIGHT-OF-WAY WITHOUT THE APPROPRIATE WRITTEN APPROVAL. THE PLAN SHALL NOT INCREASE OR DIVERT WATER TOWARDS UTILITY FACILITIES. ANY CHANGES TO EXISTING UTILITY FACILITIES TO ACCOMMODATE THE PLAN MUST BE APPROVED BY THE AFFECTED UTILITY OWNER PRIOR TO IMPLEMENTING THE PLAN. THE APPLICANT IS RESPONSIBLE FOR THE COST TO RELOCATE OR PROTECT EXISTING UTILITIES OR TO PROVIDE INTERIM ACCESS.
6. A PROFESSIONAL ENGINEER (PE) CERTIFICATION THAT THE BMP HAS BEEN INSTALLED AND CONSTRUCTED IN GENERAL CONFORMANCE WITH THESE PLANS WILL BE REQUIRED ONCE THE BMP IS FULLY CONSTRUCTED. AN AS-CONSTRUCTED SURVEY MUST BE COMPLETED TO VERIFY FACILITY VOLUMES AND ELEVATIONS. THE AS-BUILT DRAWINGS MUST BE SUBMITTED ALONG WITH THE PE CERTIFICATION. A PE CERTIFICATION REQUIRES PERIODIC ON-SITE OBSERVATIONS BY THE ENGINEER OF RECORD OR A PERSON UNDER THEIR RESPONSIBLE CHARGE. COORDINATION WITH THE ENGINEER OF RECORD TO ENSURE THAT THE NECESSARY ON-SITE OBSERVATIONS ARE COMPLETED IS THE RESPONSIBILITY OF THE APPLICANT.
7. THE CONTRACTOR SHOULD CONTACT THE ENGINEER OF RECORD AND GEC INSPECTOR IMMEDIATELY SHOULD CONSTRUCTION OF THE BMP VARY IN ANY WAY FROM THE PLANS.
8. RETAINING WALLS WILL BE DESIGNED FOR ADDITIONAL LOADING SUCH AS FOOTINGS BELOW EURV, ETC.

PROJECT DATA

PARCEL NUMBER	
BMP CALCULATIONS	FINAL DRAINAGE REPORT CONSTITUTION STORAGE DEVELOPMENT
GRADING, EROSION & STORMWATER QUALITY CONTROL PLAN	GRADING & EROSION CONTROL PLANS IN PROGRESS
FUNCTIONAL MAINTENANCE OF THE PCM STRUCTURES WILL BE COMPLETED BY:	JOHNSON DEVELOPMENT ASSOCIATES, INC.
AESTHETIC MAINTENANCE OF THE PCM WILL BE COMPLETED BY:	JOHNSON DEVELOPMENT ASSOCIATES, INC.
100-YEAR WATER SURFACE ELEVATION	6504.36
EURV WATER SURFACE ELEVATION	6504.06
WQCV WATER SURFACE ELEVATION	6502.96
SOIL DATA	SOIL DATA FOR CONSTITUTION STORAGE WAS OBTAINED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE (NRCS) WEB SOIL SURVEY. SOILS WITHIN THE SITE ARE PREDOMINATELY TRUCKTON SANDY LOAM, SOIL CLASSIFICATION A. GEOTECH PER KUMAR & ASSOCIATES, INC., REPORT AND AMMENDUM #21-2-272
VEGETATION	SITE DEVELOPMENT PLAN IN PROGRESS
FEMA FLOOD INSURANCE RATE MAP	ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM NUMBER 08041C0752G), EFFECTIVE DATE DECEMBER 7, 2018, THE PROJECT SITE LIES OUTSIDE OF THE 100-YEAR AND 500-YEAR FLOODPLAINS. THE PROJECT SITE IS LOCATED IN ZONE X DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

POND COST ESTIMATE

ITEM		JOB TOTAL	UNIT	UNIT PRICE	TOTAL
1	SOIL RIP RAP TRICKLE CHANNEL	102	LF	$5.00	$510.00
2	FOREBAY W/ T-BAFFLE	1	EA	$4,000.00	$4,000.00
3	MICROPOOL	1	EA	$2,500.00	$2,500.00
4	POND ACCESS ROAD (GRAVEL)	49	CY	$15.00	$735.00
	SUBTOTAL =				$7,745.00
	CONTINGENCY (10%)				$774.50
	GRAND TOTAL =				$8,519.50



SITE MAP
0 40 80
SCALE: 1"=80'

ENGINEER'S STATEMENT
THIS PERMANENT CONTROL MEASURE (PCM) PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION, WAS DESIGNED IN ACCORDANCE WITH THE CITY OF COLORADO SPRINGS DRAINAGE CRITERIA MANUAL (MAY 2014), AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THIS PERMANENT BMP PLAN.

SIGNATURE: ______________________ DATE: ______________.

PRINTED NAME: ______________________ SEAL

DEVELOPER'S/OWNER'S STATEMENT
JOHNSON DEVELOPMENT ASSOCIATES HEREBY CERTIFIES THAT THE PCM FOR CONSTITUTION STORAGE SHALL BE CONSTRUCTED ACCORDING TO THE DESIGN PRESENTED IN THIS PLAN. I UNDERSTAND THAT EL PASO COUNTY DOES NOT AND WILL NOT ASSUME LIABILITY FOR THE DRAINAGE FACILITIES DESIGNED AND/OR CERTIFIED BY MY ENGINEER AND THAT ARE SUBMITTED TO EL PASO COUNTY; AND CANNOT, ON BEHALF OF JOHNSON DEVELOPMENT ASSOCIATES, GUARANTEE THAT THE FINAL DRAINAGE DESIGN REVIEW WILL ABSOLVE JOHNSON DEVELOPMENT ASSOCIATES AND/OR THEIR SUCCESSORS AND/OR ASSIGNS OF FUTURE LIABILITY FOR IMPROPER DESIGN.

DEVELOPER/OWNER SIGNATURE: ______________________.

NAME OF DEVELOPER/OWNER: ______________________ DATE: ______________.

DBA: JOHNSON DEVELOPMENT ASSOCIATES, INC. PHONE: ______________.

TITLE: ______________________ EMAIL: ______________.

ADDRESS: ______________________ FAX: ______________.

CITY OF COLORADO SPRINGS STATEMENT:
FILED IN ACCORDANCE WITH SECTION 7.7.1503 OF THE CODE OF THE CITY OF COLORADO SPRINGS, 2001, AS AMENDED.

______________________ DATE: ______________.
FOR THE CITY ENGINEER

NOTES:
THE CITY OF COLORADO SPRINGS APPROVES THESE PLANS BASED UPON THE NON-JURISDICTIONAL STATUS OF THE FACILITY. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO FOLLOW UP WITH THE STATE DIVISION OF WATER RESOURCES FOR JURISDICTIONAL DETERMINATION. IF UPON STATE REVIEW THE CLASSIFICATION CHANGES TO JURISDICTIONAL, ADDITIONAL CITY REVIEW AND APPROVAL WILL BE NECESSARY.

CAUTION - NOTICE TO CONTRACTOR
1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIESTO THE ENGINEER PRIOR TO CONSTRUCTION.
2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

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NOT FOR CONSTRUCTION

PRIVATE PERMANENT CONTROL MEASURE PLAN
CONSTITUTION STORAGE

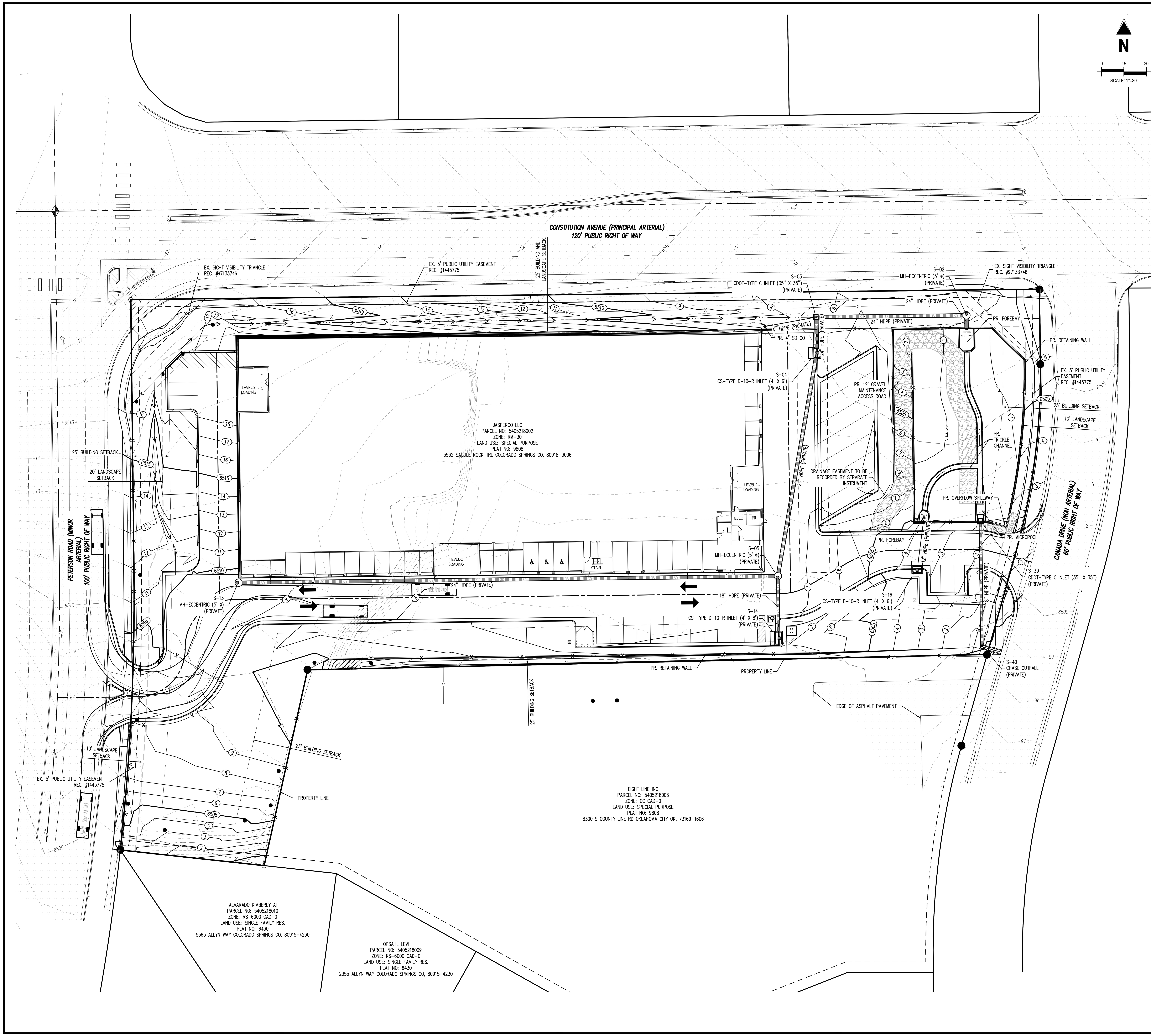
JOHNSON DEVELOPMENT ASSOCIATES

6855 CONSTITUTION AVENUE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	ASA/MRK
Checked By:	RGD
Date:	DECEMBER 2022

PCM0.0
Sheet 1 of 6



LEGEND

PROPERTY LINE
PROPOSED EASEMENT
EXISTING EASEMENT
5465 PROPOSED MAJOR CONTOUR
66 PROPOSED MINOR CONTOUR
6940 EXISTING MAJOR CONTOUR
41 EXISTING MINOR CONTOUR
PROPOSED OPAQUE LANDSCAPE FENCE
PROPOSED SPLIT RAIL FENCE
PROPOSED BUILDING OUTLINE
PROPOSED CROSS PAN
PROPOSED SIDEWALK
PROPOSED HEAVY DUTY CONCRETE
PROPOSED DETECTABLE WARNING SURFACE
PROPOSED GRAVEL MAINTENANCE ACCESS
PROPOSED RETAINING WALL
EXISTING SIDEWALK
EXISTING FENCE
PROPOSED STORM PIPE
SD PROPOSED STORM PIPE <12"
SD EXISTING STORM PIPE
EXISTING CURB & GUTTER
PROPOSED CURB & GUTTER
PROPOSED STORM DRAIN STRUCTURES
EXISTING STORM DRAIN STRUCTURES

BASIS OF BEARINGS

BASIS OF BEARING: ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST BEARS N89°20'41"E, MONUMENTED BY THE NORTHWEST CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 4842 1985" IN RANGE BOX, AND BY THE NORTH QUARTER CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 30829 2003", AS SHOWN HEREON.

BENCHMARK

COLORADO SPRINGS UTILITIES FACILITIES INFORMATION MANAGEMENT SYSTEM (FIMS) BENCHMARK SR07 BEING A 2" ALUMINUM CAP STAMPED "CSU FIMS CONTROL SR07" AT THE SOUTHEAST CORNER OF THE CONCRETE BASE FOR AN ELECTRIC VAULT ON THE WEST SIDE OF PETERSON ROAD, ABOUT 360' SOUTH OF THE CENTER LINE OF LEOTI DRIVE.

FIMS DATUM ELEVATION = 6534.61

CAUTION – NOTICE TO CONTRACTOR

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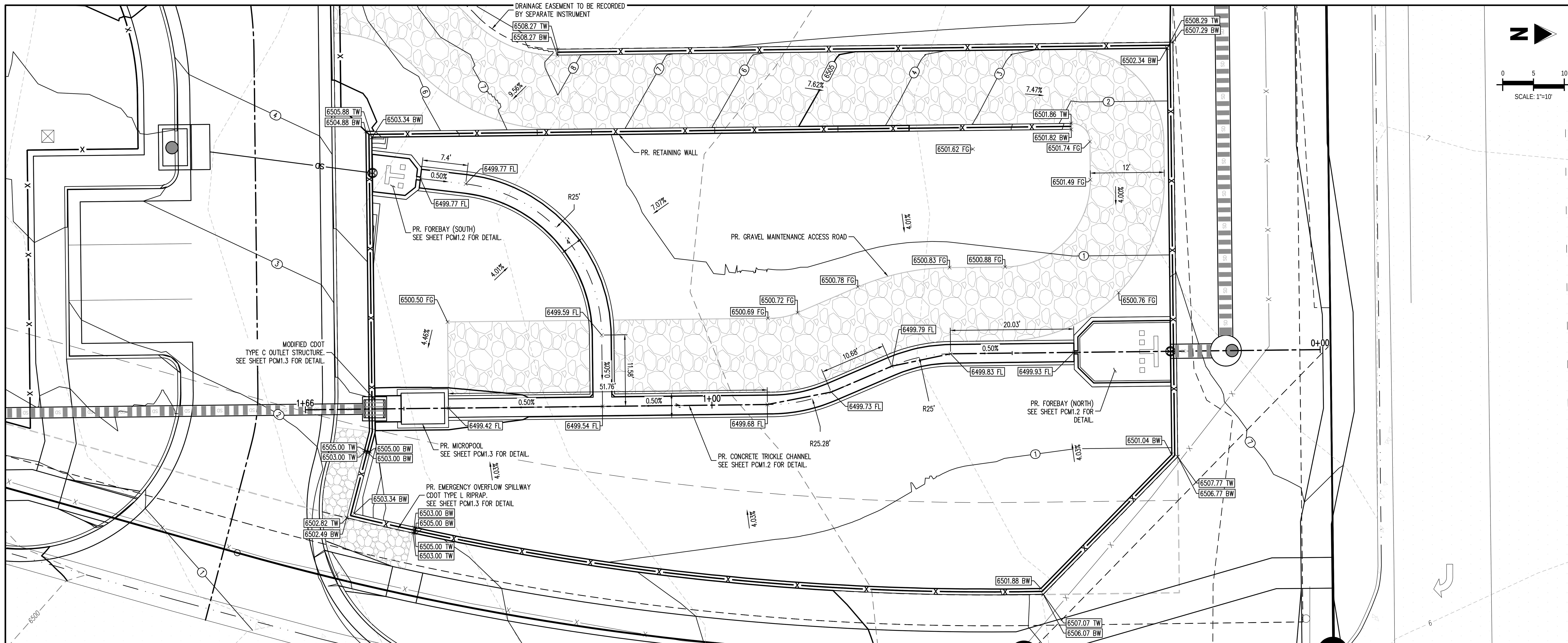
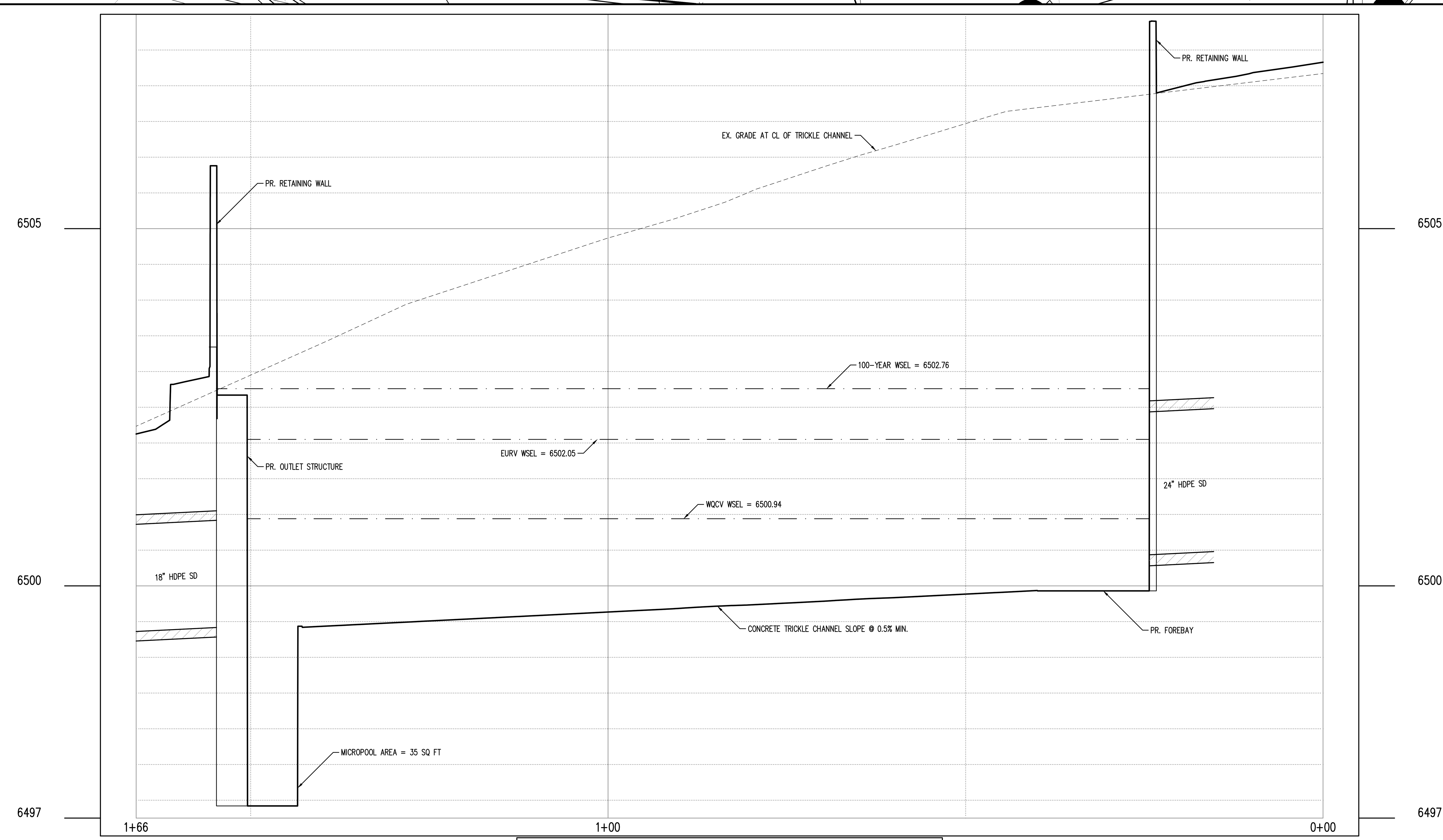
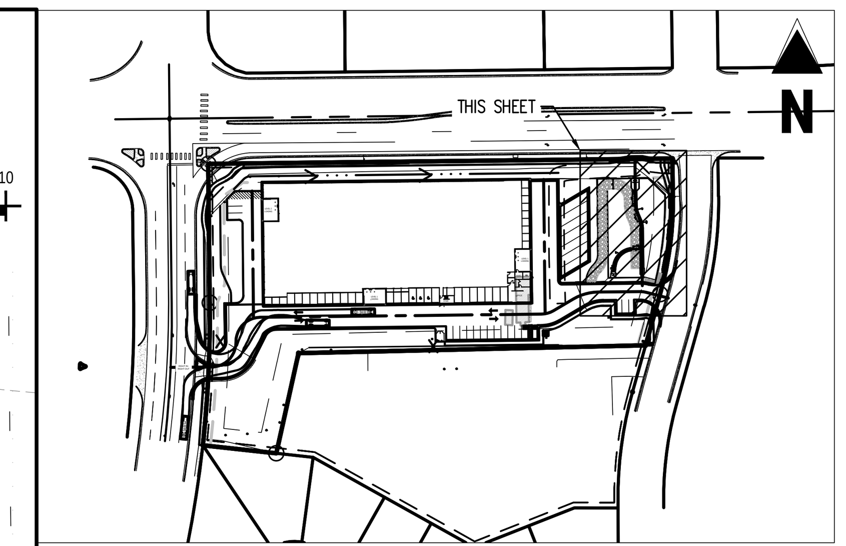
PCM1.0





POND CL (STA: 0+00 TO 1+66) – SCALE: H: 1"=10' V: 1"=1'



KEY MAP

LEGEND

- PROPERTY LINE
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED OPAQUE LANDSCAPE FENCE
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- PROPOSED GRAVEL MAINTENANCE ACCESS
- PROPOSED RETAINING WALL
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- EXISTING FENCE
- PROPOSED STORM PIPE
- PROPOSED STORM PIPE <12"
- EXISTING STORM PIPE
- EXISTING CURB & GUTTER
- PROPOSED CURB & GUTTER
- PROPOSED STORM DRAIN STRUCTURES
- EXISTING STORM DRAIN STRUCTURES

NOTE: SEE APPROVED DEVELOPMENT PLAN FOR THE PROPOSED LANDSCAPING PLANS FOR LANDSCAPING WITHIN THE PERMANENT BMP AREA.

NOTE: CONTRACTOR SHALL PROTECT ALL EXISTING SURVEY MONUMENTATION. CONTRACTOR SHALL HAVE LICENSED SURVEYOR REPLACE ANY DAMAGED OR DISTURBED MONUMENTATION AT THEIR COST.

NOTE: CONTRACTOR RESPONSIBLE FOR AS-BUILT DRAWINGS, TESTS, REPORTS, AND/OR ANY OTHER CERTIFICATES OF INFORMATION AS REQUIRED FOR ACCEPTANCE OF WORK FROM CITY, UTILITY DISTRICTS OR ANY OTHER GOVERNING AGENCY.

NOTES:

1. ADD 6500 TO ALL SPOT ELEVATIONS.
2. REFER TO CONSTITUTION STORAGE PRIVATE IMPROVEMENT PLANS FOR ALL STORM PIPE, INLET, MANHOLE AND APPURTENANCE INFORMATION.
3. ALL STORM PIPE SHALL BE RCP CLASS 3 MINIMUM OR HDPE IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS, UNLESS OTHERWISE NOTED. TRENCH BEDDING SHALL BE IN ACCORDANCE WITH CITY SPECIFICATIONS.
4. ALL STORMWATER FACILITIES SHOWN ON THESE PLANS ARE ASSUMED PRIVATE UNLESS OTHERWISE NOTED.
5. WALLS EXCEEDING 4' (MEASURED FROM BOTTOM OF FOOTING TO TOP OF WALL) MAY REQUIRE A BUILDING PERMIT.
6. EXISTING VEGETATION CONSISTS OF NATURAL GRASSES AND SHRUBS.
7. SOILS WITHIN THE SITE ARE TRUCKTON SANDY LOAM.
8. SEE SHEET B1.2 FOR POND DETAILS.
9. BOTTOM OF POND TO HAVE A MINIMUM SLOPE OF 3% TO THE TRICKLE CHANNEL AND MICROPOOL.

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CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

6855 CONSTITUTION AVENUE
COLORADO SPRINGS, CO 80915

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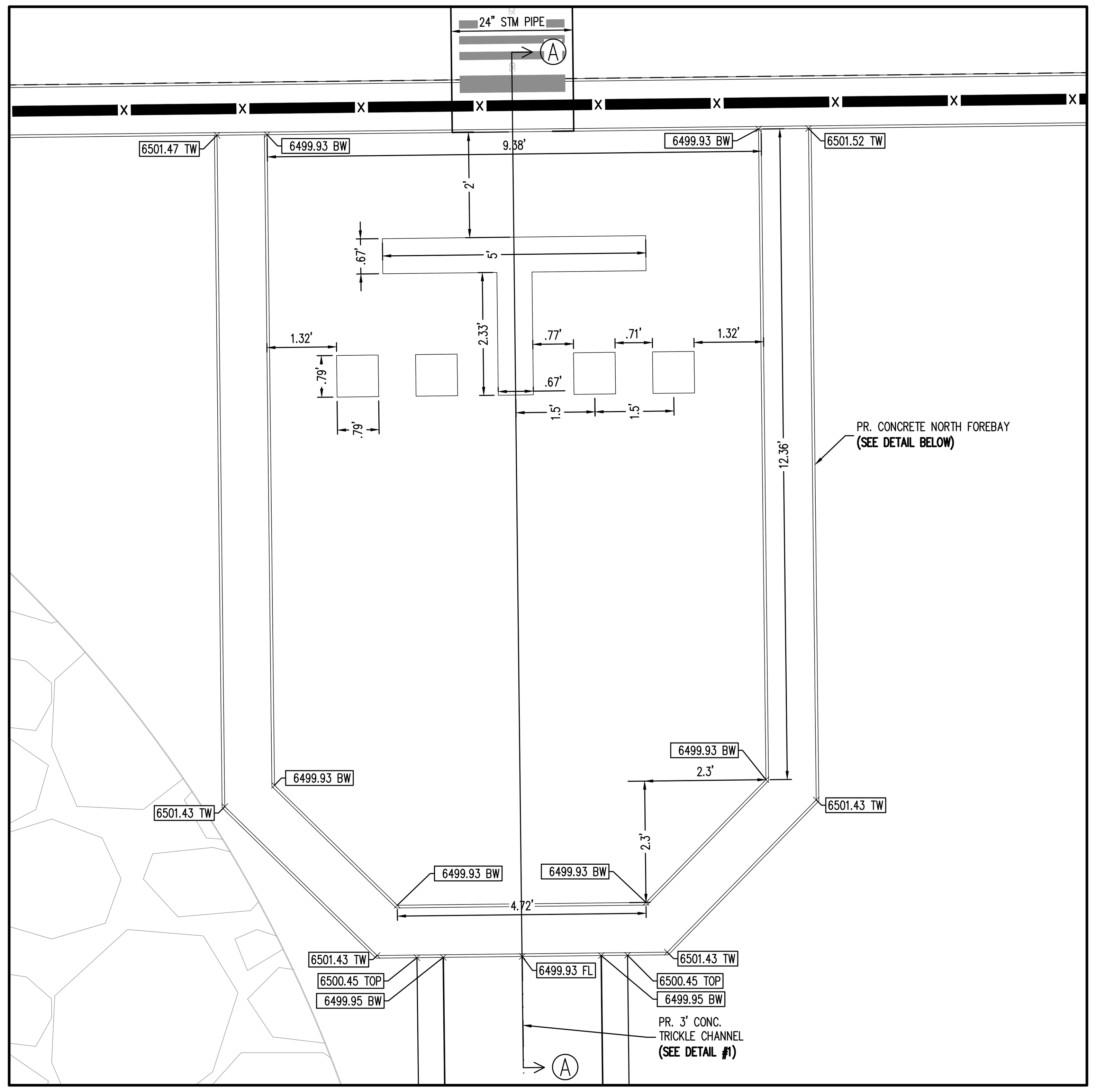
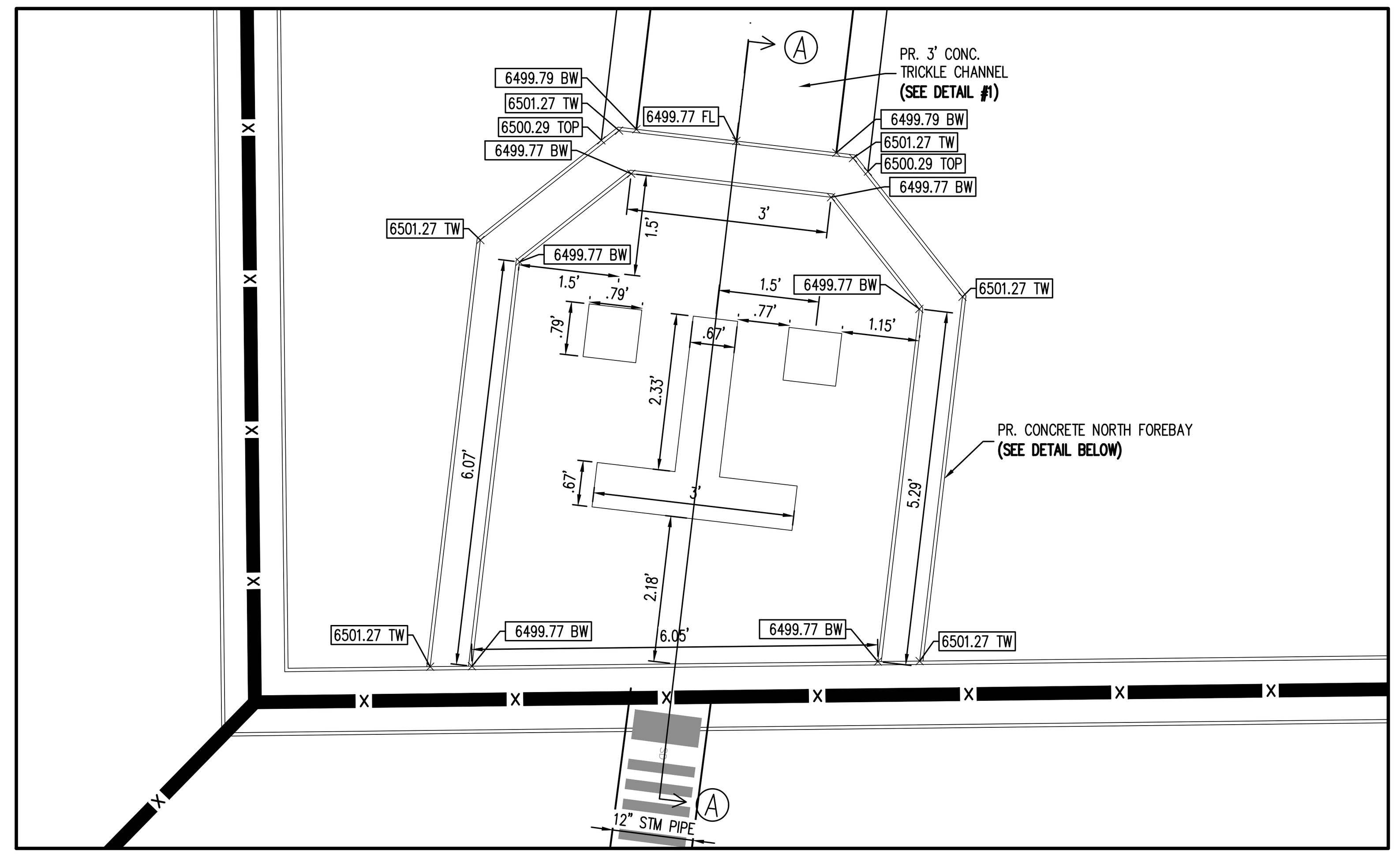
Project No:	JDA02
Drawn By:	ASA/MRK
Checked By:	RGD
Date:	DECEMBER 2022

PCM1.1

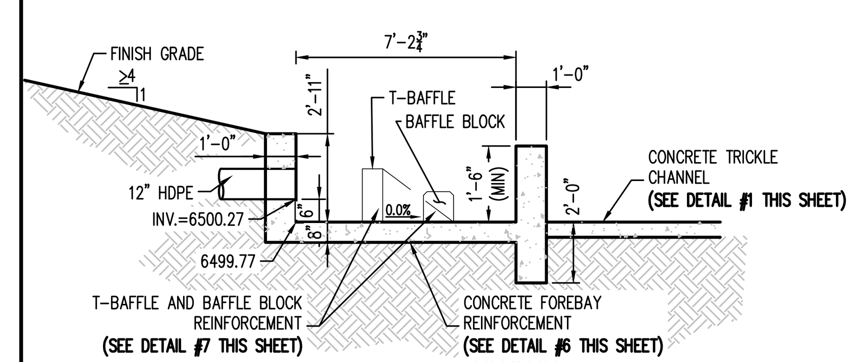
Sheet 3 of 6



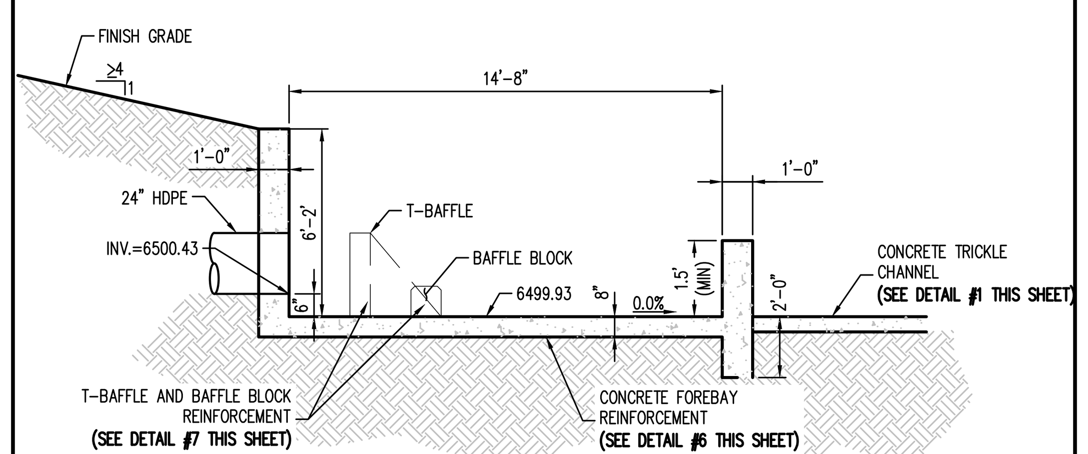
NORTH FOREBAY GRADING PLAN
SCALE 1" = 2'



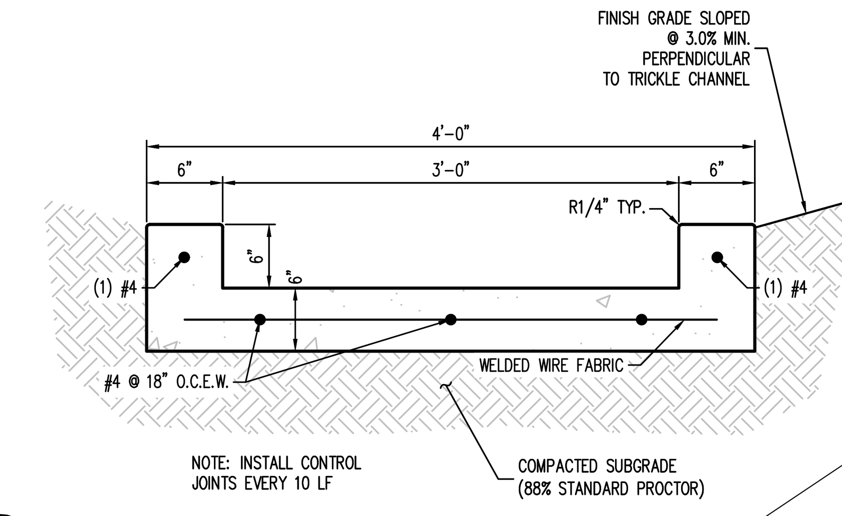
SOUTH FOREBAY GRADING PLAN
SCALE 1" = 2'



SOUTH FOREBAY PROFILE VIEW — SECTION A–A
SCALE 1" = 5'



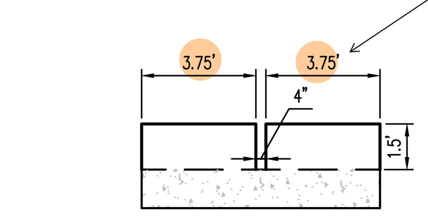
NORTH FOREBAY PROFILE VIEW — SECTION A–A
SCALE 1" = 5'



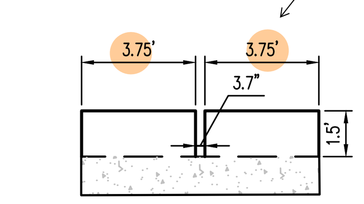
1 TRICKLE CHANNEL DETAIL
NOT TO SCALE

what are these measurements referencing?

NOT FOR CONSTRUCTION



2 NORTH FOREBAY SLOT DETAIL
SCALE: 1"=5'



3 SOUTH FOREBAY SLOT DETAIL
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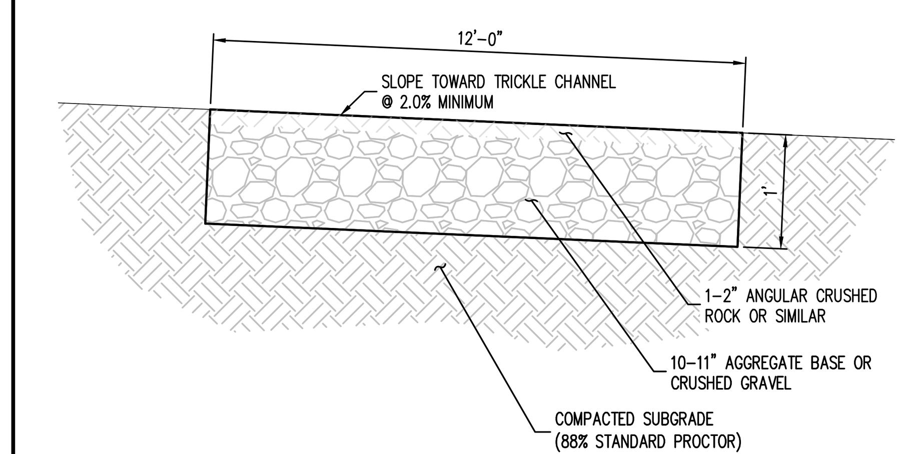


4 MAINTENANCE ACCESS DETAIL
NOT TO SCALE

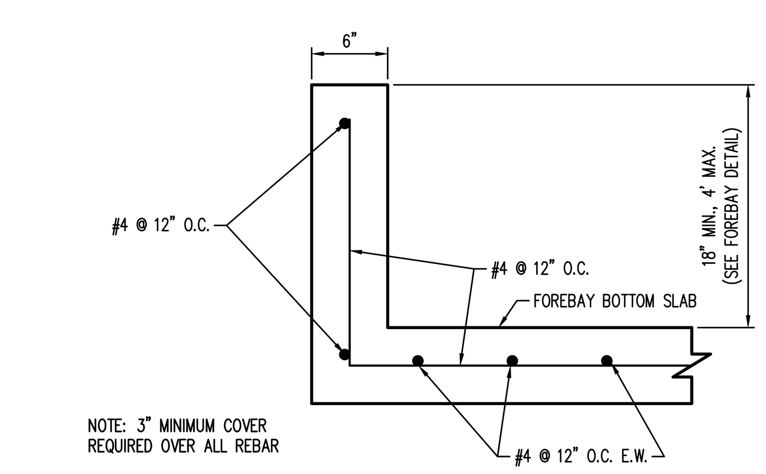
WARNING

UNAUTHORIZED MODIFICATION OF THIS OUTLET IS A KNOWING VIOLATION OF SECTION 309 OF THE CLEAN WATER ACT.

PUNISHMENT: FINE AND/OR IMPRISONMENT: 3–6 YEARS

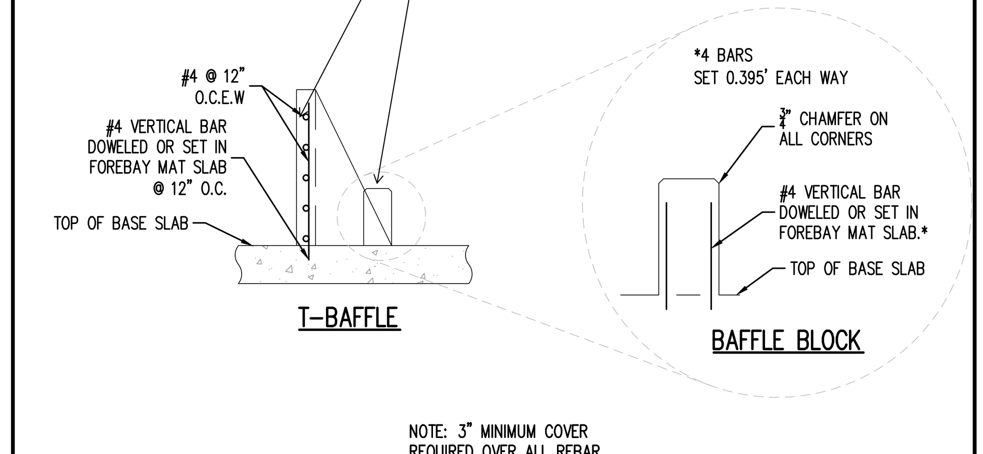
NOTES:
- ONE (1) SIGN SHALL BE POSTED ON OR NEAR THE OUTLET STRUCTURE WITH THE ABOVE MESSAGE
- SIGN SHOULD BE A MINIMUM OF 0.75 SQUARE FEET
- SIGNS SHALL BE DURABLE MATERIALS, SUCH AS METAL OR PLASTIC, USING RED LETTERING ON A WHITE BACKGROUND.

5 OUTLET STRUCTURE SIGN DETAIL
NOT TO SCALE



6 FOREBAY REINFORCING DETAIL
NOT TO SCALE

show baffle height



7 FOREBAY – T-BAFFLES & BAFFLE BLOCKS REINFORCING DETAIL
NOT TO SCALE

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PRIVATE PERMANENT CONTROL MEASURE PLAN
CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

6855 CONSTITUTION AVENUE
COLORADO SPRINGS, CO 80915

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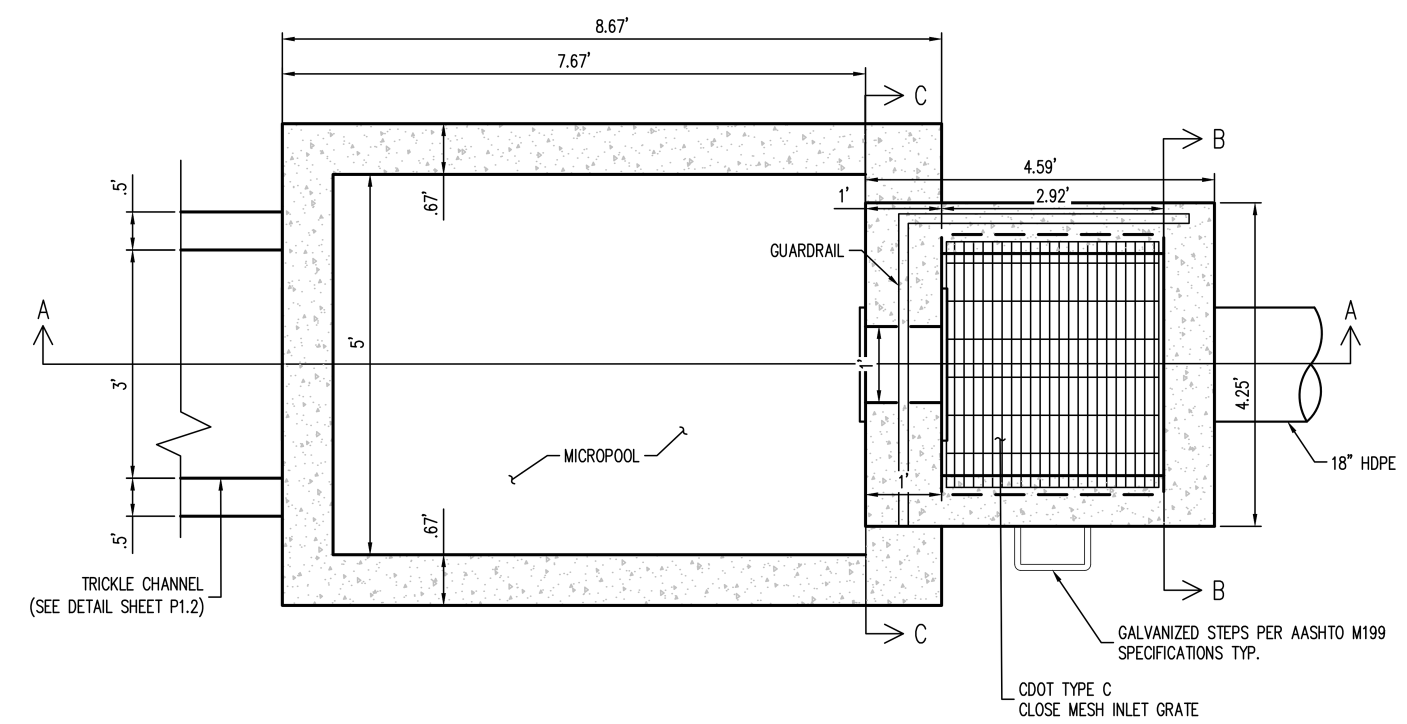
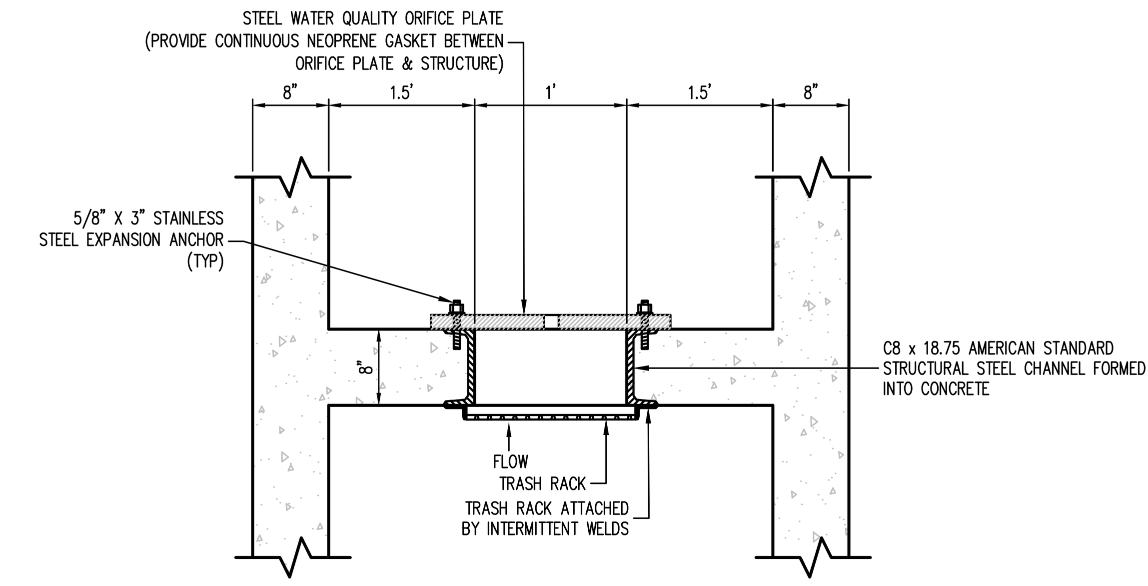
Project No:	JDA02
Drawn By:	ASA/MRK
Checked By:	RGD
Date:	DECEMBER 2022

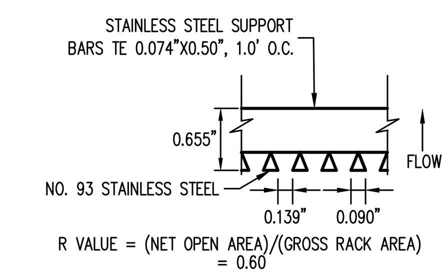
PCM1.2
Sheet 4 of 6



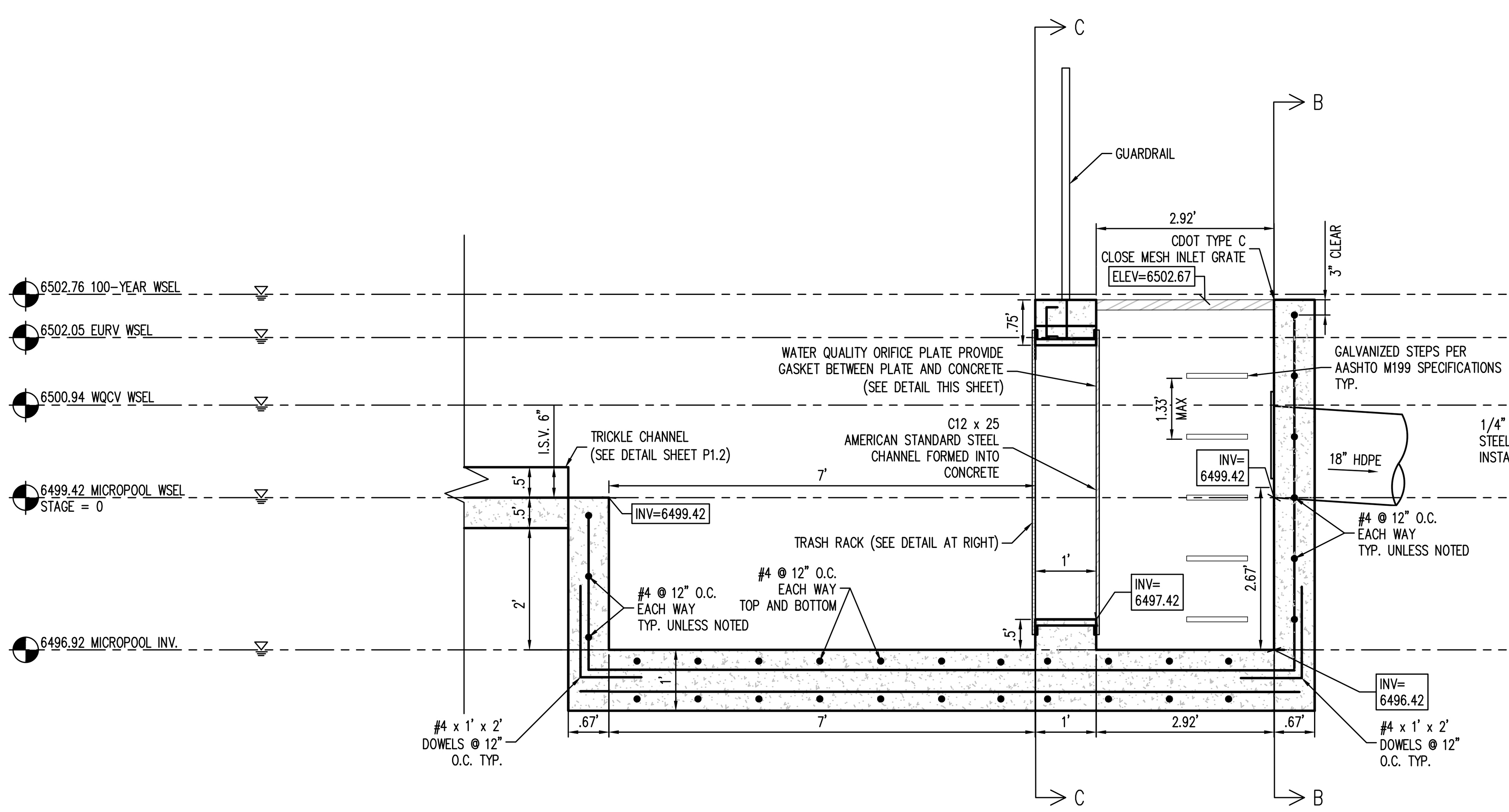
POND OUTLET CONTROL STRUCTURE – PLAN DETAIL



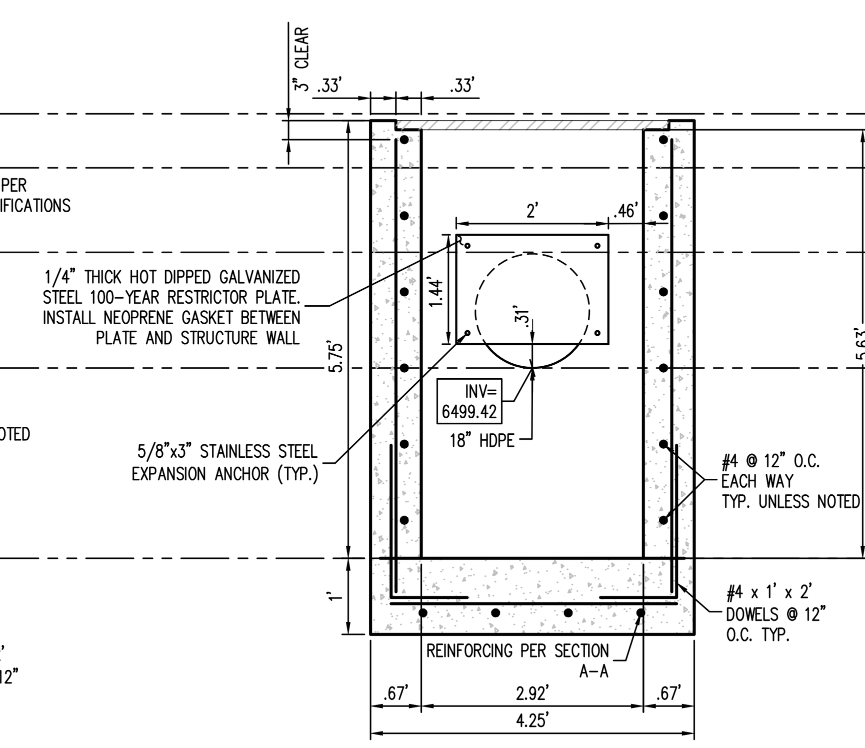
SECTION D–D
NOT TO SCALE



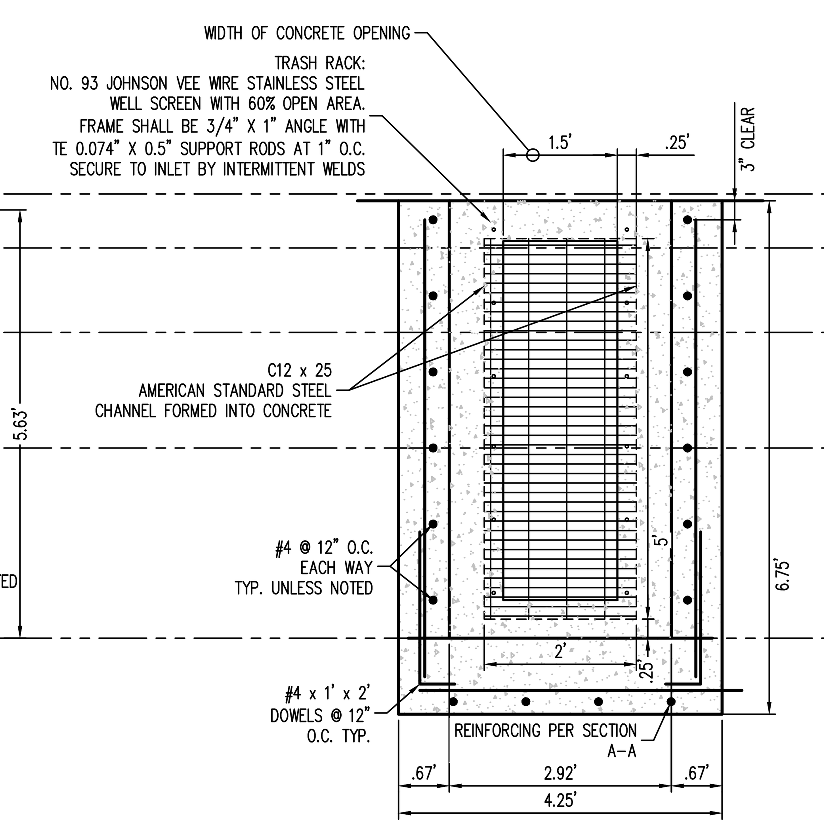
TRASH RACK SECTION
SCALE: 1" = 1'



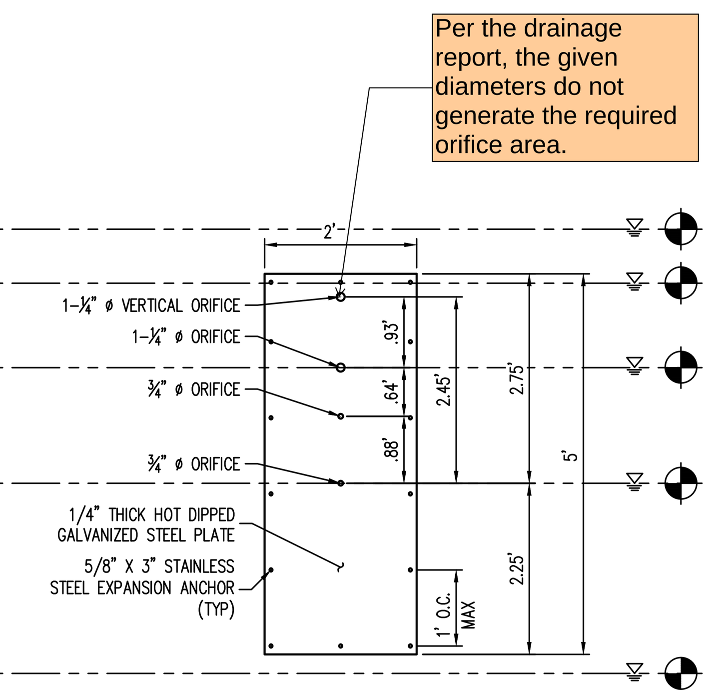
POND OUTLET CONTROL STRUCTURE – SECTION A–A



SECTION B–B

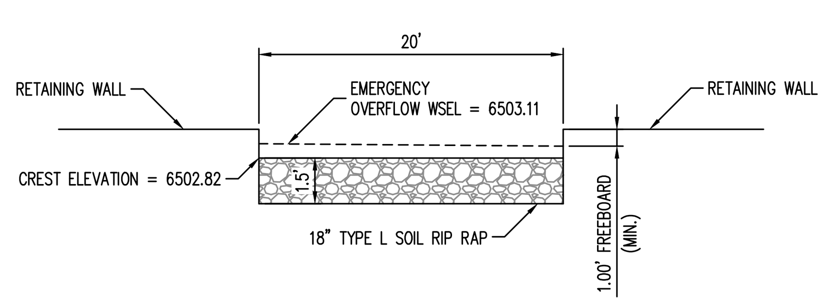


TRASH RACK – SECTION C–C

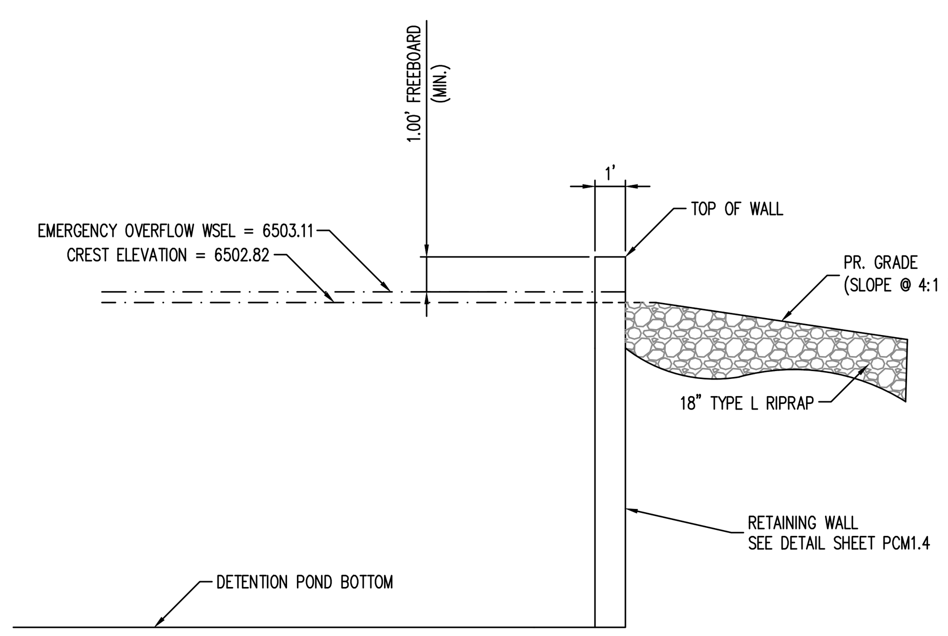


WQCV ORIFICE PLATE DETAIL

1 POND OUTLET STRUCTURE
SCALE: 1" = 2'



2 POND 100–YEAR OVERFLOW – CROSS SECTION
NOT TO SCALE



3 POND 100–YEAR OVERFLOW – PROFILE
NOT TO SCALE

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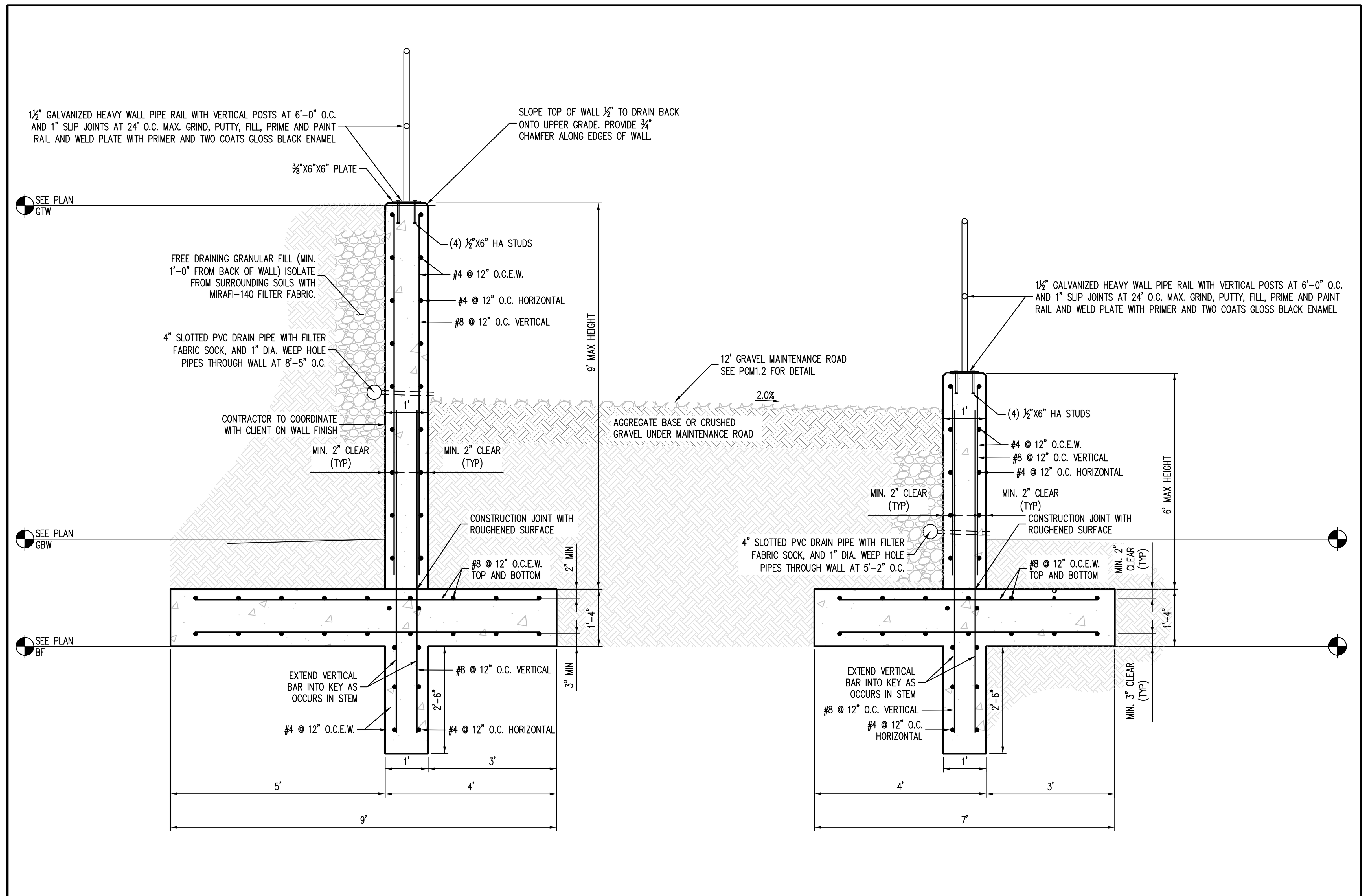
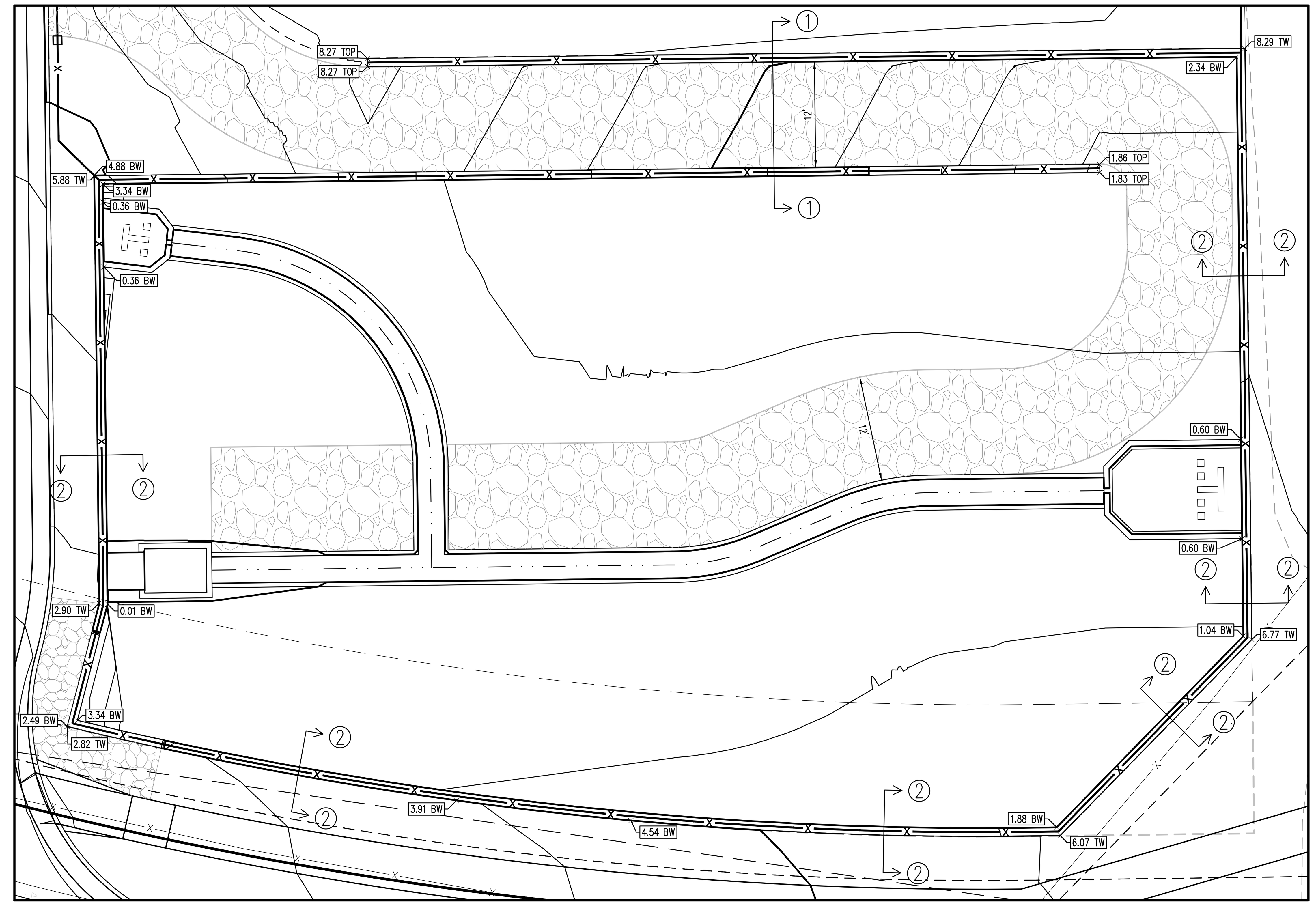
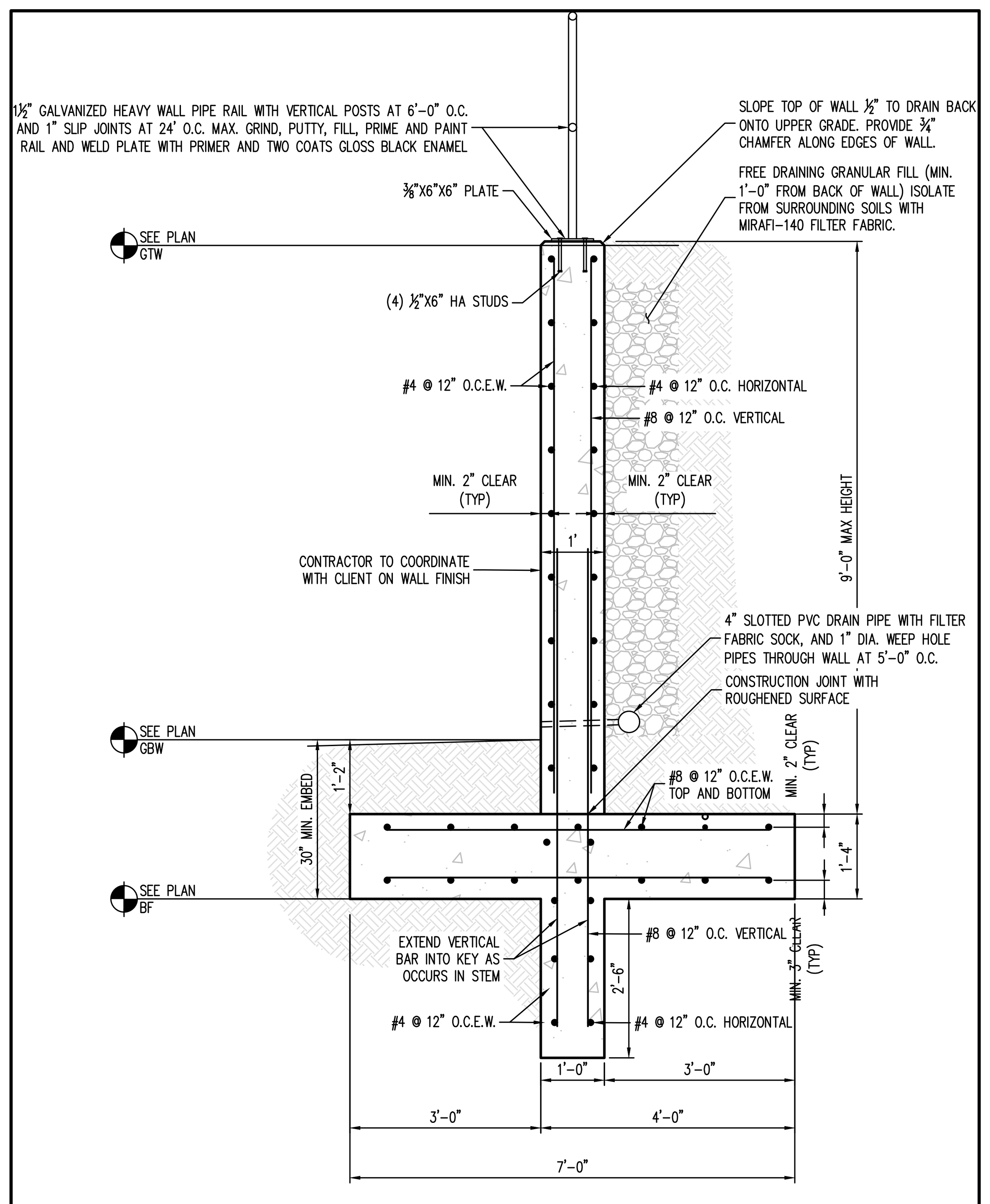
PCM1.3
Sheet 5 of 6



1 CAST IN PLACE CONCRETE RETAINING WALL - TYPICAL SECTION
SCALE: 1"=2'



CAST IN PLACE CONCRETE RETAINING WALLS - PLAN VIEW



2 CAST IN PLACE CONCRETE RETAINING WALL - TYPICAL SECTION
SCALE: 1"=2'

GENERAL STRUCTURAL NOTES

GENERAL REQUIREMENTS

GOVERNING CODE: THE DESIGN AND CONSTRUCTION OF THIS PROJECT IS GOVERNED BY THE "NORTH CAROLINA BUILDING CODE", 2015 EDITION, HEREAFTER REFERRED TO AS THE NCBC, AS ADOPTED BY CITY OF COLORADO SPRINGS CONSTRUCTION STANDARDS DIVISION UNDERSTOOD TO BE THE AUTHORITY HAVING JURISDICTION (AHJ).

TEMPORARY SHORING, BRACING: THE CONTRACTOR IS RESPONSIBLE FOR THE STRENGTH AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION AND SHALL PROVIDE TEMPORARY SHORING, BRACING AND OTHER ELEMENTS REQUIRED TO MAINTAIN STABILITY UNTIL THE STRUCTURE IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE WORK REQUIRED IN THE CONSTRUCTION DOCUMENTS AND THE REQUIREMENTS FOR EXECUTING IT PROPERLY.

SITE VERIFICATION: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE. CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.

ADJACENT UTILITIES: THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO EARTHWORK, FOUNDATIONS, SHORING, AND EXCAVATION. ANY UTILITY INFORMATION SHOWN ON THE DRAWINGS AND DETAILS IS APPROXIMATE AND NOT NECESSARILY COMPLETE.

SPECIAL INSPECTIONS AND TESTING

INSPECTIONS: SPECIAL INSPECTIONS AND TESTING SHALL BE IN ACCORDANCE WITH THE STATEMENT OF SPECIAL INSPECTIONS PER RBC SECTION 109.7 AND IBC SECTIONS 1704, 1705, AS APPLICABLE.

SPECIAL INSPECTORS: SPECIAL INSPECTORS SHALL BE EMPLOYED BY THE OWNER. SPECIAL INSPECTORS SHALL BE QUALIFIED PERSONS WHO ARE REGISTERED WITH AN APPROVED AGENCY.

INSPECTION SUBMITTALS: SPECIAL INSPECTION REPORTS SHALL BE PROVIDED ON A WEEKLY BASIS. FINAL SPECIAL INSPECTION REPORTS WILL BE REQUIRED BY EACH SPECIAL INSPECTION FIRM PER IBC 1704.1.2. SUBMIT COPIES OF ALL INSPECTION AND TESTING REPORTS TO THE ARCHITECT/ENGINEER AND THE AUTHORITY HAVING JURISDICTION FOR REVIEW AS SOON AS THEY ARE AVAILABLE.

SCHEDULE OF SPECIAL INSPECTIONS

	DESCRIPTION OF SPECIAL INSPECTION	PERIODIC	CONTINUOUS
SOILS	FOOTING SOIL BEARING SURFACES	X	
	EXCAVATION DEPTH AND BEARING LAYER	X	
	COMPACTED FILL MATERIAL; PHYSICAL PROPERTIES	X	
	SUBGRADE PREPARATION PRIOR TO BACKFILL	X	
	BACKFILLING OPERATIONS IN ACCORDANCE WITH GEOTECHNICAL REPORT RECOMMENDATIONS INCLUDING LIFT THICKNESS, DENSITY TESTING, MOISTURE CONTENT, MATERIAL PROPERTIES		X
CONCRETE CONSTRUCTION	SIZE & PLACEMENT OF ALL REINFORCING STEEL	X	
	PLACEMENT CLEARANCES AROUND REINFORCING STEEL AT EMBEDDED CONDUIT	X	
	SHAPE, LOCATION & DIMENSIONS OF MEMBERS FORMED	X	
	USE OF THE REQUIRED DESIGN CONCRETE MIX	X	
	MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	X	
	VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS	X	
	PLACING & SIZE OF CAST-IN-PLACE ANCHOR BOLTS AND EMBEDDED FABRICATIONS PRIOR TO THE POUR	X	
	PLACING OF CONCRETE AROUND CAST-IN-PLACE BOLTS AND EMBEDS		X
	SAMPLING OF FRESH CONCRETE		X
	DETERMINATIONS OF SLUMP, AIR CONTENT, AND TEMPERATURE		X
	GROUTING OPERATION OF REBAR DOWELS		X

SOILS AND FOUNDATIONS

1. FOUNDATIONS FOR ALL STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT PREPARED FOR THIS SITE.
2. THE CONTRACTOR MUST FULLY REVIEW THIS REPORT PRIOR TO CONSTRUCTION.
3. INFORMATION IN THE GEOTECHNICAL REPORT SUPERSEDES ANY CONFLICTING INFORMATION CONTAINED IN THE CDS.

GEOTECHNICAL REPORT	PREPARED BY:	REPORT NO.	REPORT DATE
	KUMAR & ASSOCIATES, INC.	REPORT - 21-2-272 ADDENDUM - 21-1-272	FEBRUARY 3, 2022 MARCH 22, 2022
DESIGN CRITERIA	NET ALLOWABLE SOIL BEARING PRESSURE D+L	2500 PSF	
	MINIMUM EMBEDMENT (BELOW EXT. GRADE OR SLAB SUBGRADE)	30 INCHES	
	EQUIVALENT FLUID PRESSURE, ACTIVE	55 PSF	
	EQUIVALENT FLUID PRESSURE, PASSIVE	180 PSF	

CAST-IN-PLACE CONCRETE

REFERENCE STANDARDS:

1. ACI 301-10 "SPECIFICATIONS FOR STRUCTURAL CONCRETE"
2. ACI 305.1-10 "SPECIFICATIONS FOR HOT WEATHER CONCRETING"
3. ACI 306.1-10 "SPECIFICATION FOR COLD WEATHER CONCRETING"
4. ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
5. ACI 117-10 "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"

SUBMITTALS
PROVIDE ALL SUBMITTALS REQUIRED BY ACI 301 SECTION 4.1.2. SUBMIT MIX DESIGNS FOR EACH MIX IN THE TABLE BELOW. SUBSTANTIATING STRENGTH RESULTS FROM PAST TESTS SHALL NOT BE OLDER THAN 12 MONTHS PER ACI 318 SECTION 5.3.

CONCRETE MIX DESIGN REQUIREMENTS

	STRENGTH F'C (PSI)	TEST AGE	AGGREGATE, MAX. (IN.)	EXPOSURE CLASS	W/CM RATIO	AIR CONTENT (+/-1.5%)	SLUMP, MAX. (IN.)
SPREAD FOOTING	4500	28	1	F2/S0/W0/C1	0.45	6.0	4
FOUNDATION WALLS	3500	28	1	F1/S0/W0/C1	0.55	4.5	4

CONCRETE REINFORCEMENT

MATERIALS	REINFORCING BARS ASTM	A615 GRADE 60 DEFORMED BARS

PLACING: CONFORM TO ACI 301 SECTION 3.3.2 "PLACEMENT." PLACING TOLERANCES SHALL CONFORM TO ACI 117.

CONCRETE COVER: CONFORM TO THE FOLLOWING COVER REQUIREMENTS UNLESS NOTED OTHERWISE IN THE DRAWINGS:	CONCRETE CAST AGAINST EARTH	3"
	CONCRETE EXPOSED TO EARTH OR WEATHER	2"
	TIES IN COLUMNS AND BEAMS	1-1/2"
	BARS IN SLABS	3/4"
	BARS IN WALLS	3/4"
	EXTERIOR BARS IN TILT-UP PANELS	1"

SPLICES: CONFORM TO ACI 301 SECTION 3.3.2.7, "SPLICES". REFER TO "TYPICAL LAP SPLICE AND DEVELOPMENT LENGTH SCHEDULE" FOR TYPICAL REINFORCEMENT SPLICES.

SITE LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY BOUNDARY LINE
- RIGHT OF WAY BOUNDARY LINE
- ROAD CENTERLINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- PROPOSED SWALE FLOWLINE
- PROPOSED RETAINING WALL

PAVING LEGEND

- STANDARD DUTY CONCRETE
- HEAVY DUTY CONCRETE
- STANDARD DUTY ASPHALT

CONTRACTOR RESPONSIBLE FOR AS-BUILT DRAWINGS, TESTS, REPORTS AND/OR ANY OTHER CERTIFICATES OR INFORMATION AS REQUIRED FOR ACCEPTANCE OF WORK FROM CITY, UTILITY DISTRICTS OR ANY OTHER GOVERNING AGENCY.

SURVEYOR TO OBTAIN AUTOCAD FILE FROM ENGINEER AND VERIFY ALL HORIZONTAL CONTROL DIMENSIONING PRIOR TO CONSTRUCTION STAKING. SURVEYOR MUST VERIFY ALL BENCHMARK, BASIS OF BEARING AND DATUM INFORMATION TO ENSURE IMPROVEMENTS WILL BE AT THE SAME HORIZONTAL AND VERTICAL LOCATIONS SHOWN ON THE DESIGN CONSTRUCTION DRAWINGS. PRIOR TO CONSTRUCTION STAKING ANY DISCREPANCY MUST BE REPORTED TO OWNER AND ENGINEER PRIOR TO CONTINUATION OF ANY FURTHER STAKING OR CONSTRUCTION WORK.

BASIS OF BEARINGS

BASIS OF BEARING: ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 14 SOUTH, RANGE 65 WEST BEARS N89°20'41"E, MONUMENTED BY THE NORTHWEST CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 4842 1985" IN RANGE BOX, AND BY THE NORTH QUARTER CORNER OF SAID SECTION 5, BEING A 3-1/4" ALUMINUM CAP STAMPED "PLS 30829 2003", AS SHOWN HEREON.

BENCHMARK

COLORADO SPRINGS UTILITIES FACILITIES INFORMATION MANAGEMENT SYSTEM (FIMS) BENCHMARK SR07 BEING A 2" ALUMINUM CAP STAMPED "CSU FIMS CONTROL SR07" AT THE SOUTHEAST CORNER OF THE CONCRETE BASE FOR AN ELECTRIC VAULT ON THE WEST SIDE OF PETERSON ROAD, ABOUT 360' SOUTH OF THE CENTER LINE OF LEOTI DRIVE.

FIMS DATUM ELEVATION = 6534.61

CAUTION - NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIESTO THE ENGINEER PRIOR TO CONSTRUCTION.

811 Know what's below. Call before you dig.

2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

NOT FOR CONSTRUCTION

PRIVATE PERMANENT CONTROL MEASURE PLAN
CONSTITUTION STORAGE

JOHNSON DEVELOPMENT ASSOCIATES

6855 CONSTITUTION AVENUE
COLORADO SPRINGS, CO 80915

#	Date	Issue / Description	Init.

Project No:	JDA02
Drawn By:	ASA/MRK
Checked By:	RGD
Date:	DECEMBER 2022

PCM1.4