STANDARD NOTES FOR EL PASO COUNTY GRADING & EROSION PLAN:

- 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 OFF-SITE WATERS, INCLUDING WETLANDS. 2. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRENSENTATION, 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.
- 3. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. MANAGEMENT OF THE SWMP DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR. THE SWMP 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 COULD CONTRIBUTE POLLUTANTS TO STORMWATER. CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, AND DISTURBED LAND AREAS SHALL BE INSTALLED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
- 6. ALL CONSTRUCTION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION MEASURES ARE IMPLEMENTED. TEMPORARY CONSTRUCTION CONTROL MEASURES MUST BE REMOVED PRIOR TO PERMIT CLOSEOUT.
- 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.
- 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 PLANT 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 DESIGNED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE DESIGN OR FUNCTION OF 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 SORTEST 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 THE VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED. IF COMPACTION PREVENTION IS NOT FEASIBLE DUE TO SITE CONSTRAINTS, ALL AREAS DESIGNATED FOR INFILTRATION AND VEGETATION CONTROL MEASURES MUST BE LOOSENED PRIOR TO INSTALLATION OF THE CONTROL MEASURE(S).
- 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 ENTER STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUTS SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY, CREEK OR STREAM.
- 14. DURING DEWATERING OPERATIONS, UNCONTAMINATED GROUNDWATER 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, SOIL, AND SAND THAT MAY ACCUMULATE IN ROADS, STORM DRAINS AND OTHER DRAINAGE CONVEYANCE SYSTEMS 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 CHEMICAL(S) HAVING THE POTENTIAL TO BE RELEASED IN STORMWATER ARE TO BE STORED OR USED ON-SITE
- UNLESS PERMISSION FOR THE USE OF SUCH CHEMICAL(S) IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING APPROVAL FOR THE USE OF SUCH CHEMICAL(S), SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED. 22. BULK STORAGE OF ALLOWED PETROLEUM PRODUCTS OR OTHER ALLOWED LIQUID CHEMICALS IN EXCESS OF 55
- GALLONS SHALL REQUIRE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS ON-SITE AND TO PREVENT ANY SPILLED MATERIALS FROM ENTERING STATE WATERS, ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR OTHER FACILITIES.
- 23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE CURB AND GUTTER OR DITCH EXCEPT WITH APPROVED SEDIMENT CONTROL MEASURES.
- 24. OWNER/DEVELOPER AND THEIR AGENTS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS OF THE LAND DEVELOPMENT CODE, DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (1041, NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND OTHER LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, LOCAL, OR COUNTY AGENCIES, THE MOST RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
- 25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE ONLY AT APPROVED CONSTRUCTION ACCESS POINTS.
- 26. PRIOR TO CONSTRUCTION THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES. 27. A WATER SOURCE SHALL BE AVAILABLE ON-SITE DURING EARTHWORK OPERATIONS AND SHALL BE UTILIZED AS
- 27. A WATER SOURCE SHALL BE AVAILABLE ON-SITE DURING EARTHWORK OPERATIONS AND SHALL BE UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND. 28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY RMG-ROCKY MOUNTAIN GROUP, DATED OCTOBER 8, 2021
- 28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY RMG-ROCKY MOUNTAIN GROUP, DATED OCTOBER 8, 2021 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
- ONE (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

## CHALLENGER HOMES FALCON HIGHLANDS SOUTH

SITUATED IN SECTION 12, TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO GRADING & EROSION CONTROL PLANS



 $\frac{\text{VICINITY MAP}}{1" = 1,000'}$ 

### LEGAL DESCRIPTION:

A PORTION OF SECTION 12, TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO.

### PROJECT DESCRIPTION:

378 SINGLE-FAMILY RESIDENTIAL LOT DEVELOPMENT OVER 125.5 ACRES.

### FLOODPLAIN STATEMENT:

THE SUBJECT PROPERTY IS NOT LOCATED IN A DESIGNATED FLOODPLAIN AS SHOWN ON THE FEMA FLOOD INSURANCE RATE MAP 08041C0561G, EFFECTIVE DECEMBER 7, 2018.

### NOTE:

DETENTION AND WATER QUALITY ARE PROVIDED IN THE EXISTING DOWNSTREAM WATER QUALITY AND DETENTION POND FACILITIES, POND 1, 2 & WU, LOCATED EAST OF THE PROPOSED DEVELOPMENT, NORTHWEST OF HIGHWAY 24.

### DESCRIPTION OF CONSTRUCTION ACTIVITIES:

ANTICIPATED STARTING AND COMPLETION TIME PERIOD OF SITE GRADING:

### SEPTEMBER 2023

- EXPECTED DATE ON WHICH THE FINAL STABILIZATION WILL BE COMPLETED: AUGUST 2024
- TOTAL AREA OF THE SITE TO BE CLEARED. EXCAVATED. OR GRADED:
- APPROXIMATELY 115 ACRES

### RECEIVING WATERS:

ULTIMATE RECEIVING WATER IS SAND CREEK DRAINAGE BASIN AND FALCON DRAINAGE BASIN.

### SOIL TYPE:

THE SITE IS UNDERLAIN BY BLAKELAND-FLUVAQUENTIC HAPLAQUOILS, HYDROLOGIC SOIL GROUP A.

W <u>OWNER:</u> CHALLENGER HOMES 8605 EXPLORER DRIVE STE. 250 COLORADO SPRINGS, CO 80920 (719) 598–5192 CONTACT: JIM BYERS <u>SURVEYOR:</u> ATWELL, LLC. 143 UNION BLVD. STE. 700 LAKEWOOD, CO 80228 (303) 462–1100 CONTACT: KENNETH SCHRAMM

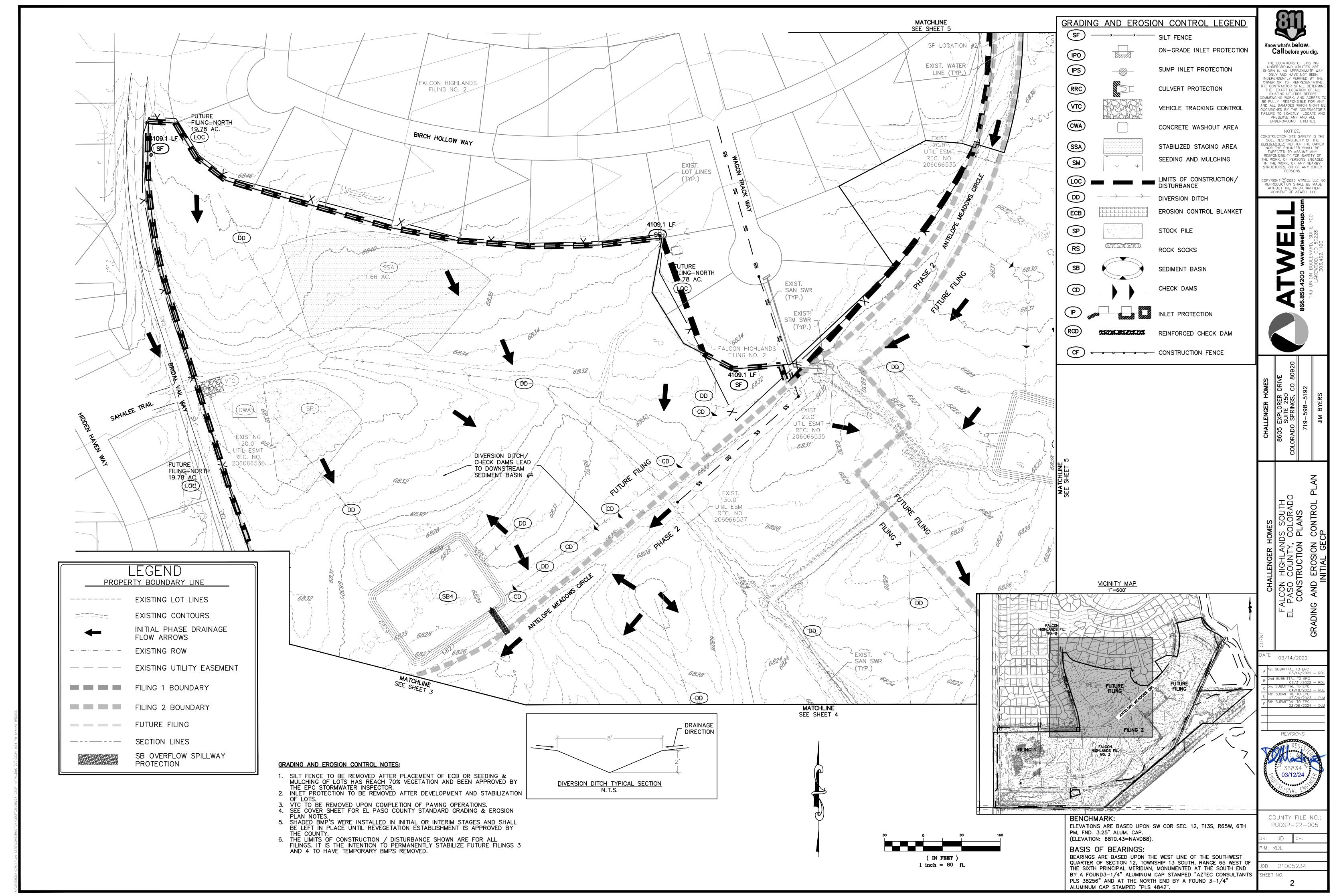
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	COVER
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3	INITIAL GECP
4	INITIAL GECP
5	INITIAL GECP
6	INTERIM GECP
7	INTERIM GECP
3	INTERIM GECP
9	INTERIM GECP
10	FINAL GECP
11	FINAL GECP
12	FINAL GECP
13	FINAL GECP
14	DETAIL GECP
15	DETAIL GECP
16	DETAIL GECP
17	DETAIL GECP

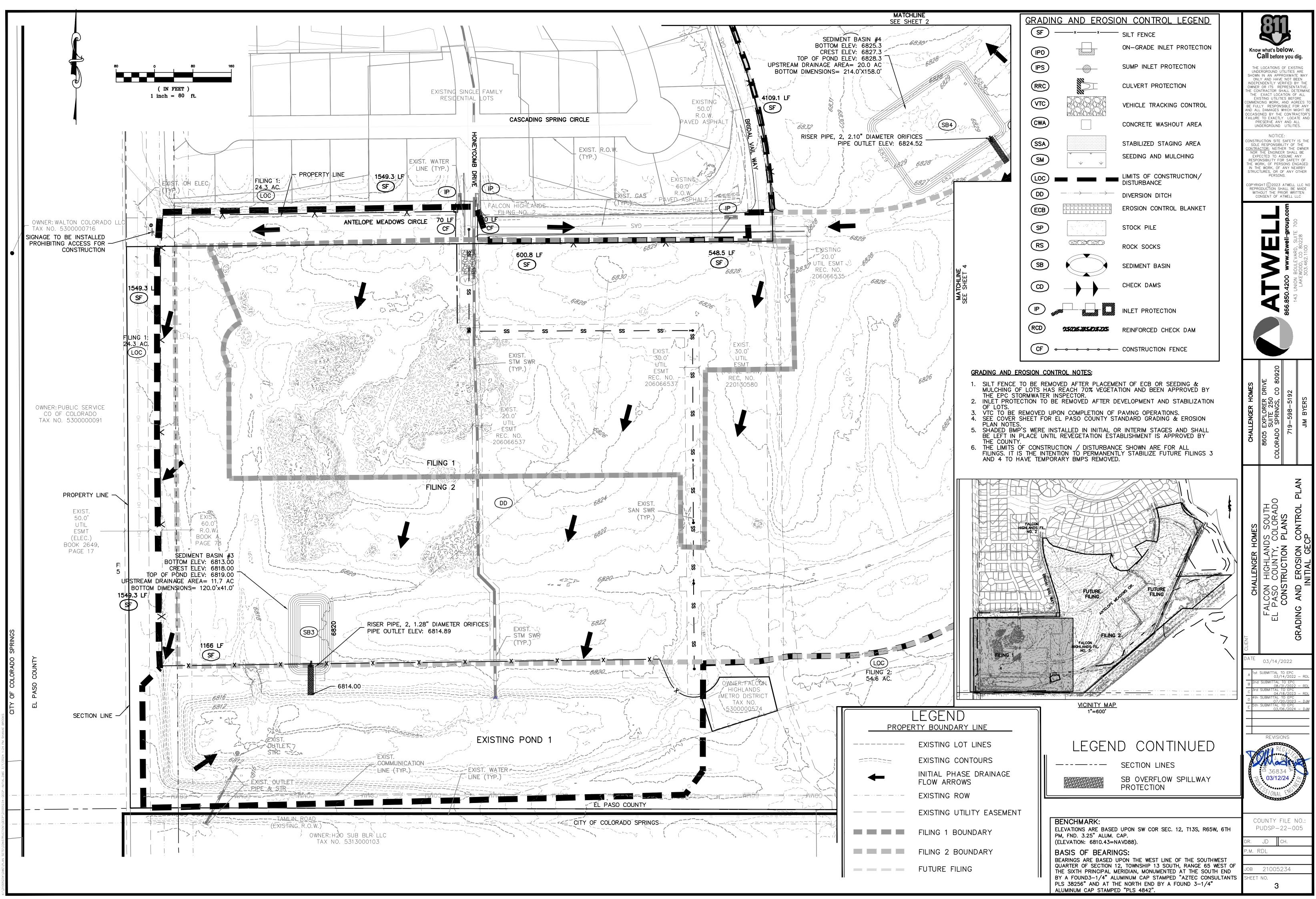
		THE UNC SHOW INDEP OWNEI THE CC THE EX COMMEN BE FU AND AL OCCASI FAILUR P	LY AND HAVE ENDENTLY VE R OR ITS RE INTRACTOR SH EXACT LOCA ISTING UTILITI ICING WORK, LLY RESPONS L DAMAGES I ONED BY THE	e you dig. OF EXISTING TILITIES ARE ROXIMATE WAY E NOT BEEN RIFIED BY THE PRESENTATIVE. HALL DETERMINE ATION OF ALL ES BEFORE AND AGREES TO SIBLE FOR ANY WHICH MIGHT BE CONTRACTOR'S Y LOCATE AND AND ALL UTILITIES.
		SOL <u>CONTR</u> NOR EXI RESP THE W IN TH STRUC	RUCTION SITE E RESPONSIBIL ACTOR; NEITH THE ENGINEE PECTED TO AS ONSIBILITY FO ORK, OF PERS IE WORK, OF CTURES, OR O PERSON	SAFETY IS THE LITY OF THE ER THE OWNER R SHALL BE SSUME ANY R SAFETY OF SONS ENGAGED ANY NEARBY OF ANY OTHER
		REPF		HALL BE MADE NOR WRITTEN TWELL LLC
	ENGINEER'S STATEMENT         THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER         MY DIRECT SUPERVISION AND IS CORRECT TO THE BEST OF MY         KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED         ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR         GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY         FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR         MISSIONS ON MY PART IN PREPARING THIS PLAN.         MILL         MILL         MILL         OWNER'S STATEMENT         J. THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE         REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.		AT WEL	866.850.4200 www.atwell-group. 143 UNION BOULEVARD, SUITE 700 LAKEWOOD, C0 80228 303.462.1100
OODMEN HILLS METROPOLITAN DISTRICT:	Jim Byers4/2/2024OWNER SIGNATURE JIM BYERSDATEEL PASO COUNTYDATECOUNTY 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	CHALLENGER HOMES	8605 EXPLORER DRIVE SUITE 250 COLORADO SPRINGS, CO 80920	719-598-5192 JIM BYERS
8046 EASTVILLE ROAD FALCON, CO 80831 (719) 495–2500 CONTACT: RYAN MANGINO CIVIL ENGINEER: ATWELL, LLC. 143 UNION BLVD., SUITE 700 LAKEWOOD, CO 80228 (303) 462–1100 CONTACT: DAN MADRUGA, PE <u>EL PASO COUNTY:</u> 3275 AKERS DRIVE OLORADO SPRINGS, CO 80922 (719) 520–6460 ONTACT: ELIZABETH NIIJKAMP <u>GENERAL NOTES:</u> 1. EXISTING VEGETATION OF	DUCUMENT 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 DIRECTOR'S DISCRETION. COUNTY ENGINEER / ECM ADMINISTRATOR DATE JOSHUA PALMER, P.E.	CHALLENGER HOMES	FALCON HIGHLANDS SOUTH EL PASO COUNTY, COLORADO	EROSION COVER
<ul> <li>GRASSES AND WEEDS.</li> <li>2. CONCLUSIONS FROM SOIL INCORPORATED IN GRADIE</li> <li>3. THERE ARE NO LOCATION</li> <li>4. THE USE OF CONSTRUCT</li> <li>5. NO DEWATERING OPERATE DISCOVERS GROUNDWATE APPROVED BY THE ENGIN</li> <li>6. THERE IS NO PROPOSED CONTROL MEASURES PRO</li> <li>7. THERE ARE NO PROPOSE</li> </ul>	S/GEOTECHNICAL REPORT AND GEOLOGIC HAZARDS REPORT NG DESIGN (SLOPES, EMBANKMENTS, MATERIALS, MITIGATION, ETC.) IS OF ANY DEDICATED ASPHALT / CONCRETE BATCH PLANTS. ON OFFICE TRAILERS REQUIRE PCD PERMITTING. ONS ARE ANTICIPATED AT THIS TIME. IF THE CONTRACTOR R, ALL CONSTRUCTION SHALL STOP UNTIL PROPER PROCEDURES NEER OF RECORD AND EL PASO COUNTY ARE PUT IN PLACE. OFFSITE DISTURBANCE AND THERE ARE NO OFFSITE STORMWATER	B 2nd C 3rd D 4th	SUBMITTAL 08/3 SUBMITTAL 04/1 SUBMITTAL 07/2 SUBMITTAL	TO EPC 4/2022 - RDL TO EPC 31/2022 - RDL TO EPC 8/2023 - RDL TO EPC 20/2023 - DJM TO EPC 36/2024 - DJM
	BENCHMARK: ELEVATIONS ARE BASED UPON SW COR SEC. 12, T13S, R65W, 6TH PM, FND. 3.25" ALUM. CAP. (ELEVATION: 6810.43=NAVD88). BASIS OF BEARINGS: BEARINGS ARE BASED UPON THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, MONUMENTED AT THE SOUTH END BY A FOUND3-1/4" ALUMINUM CAP STAMPED "AZTEC CONSULTANT	DR. P.M. JOB	PUDSP - 2 JD 0 RDL 210052	CH.

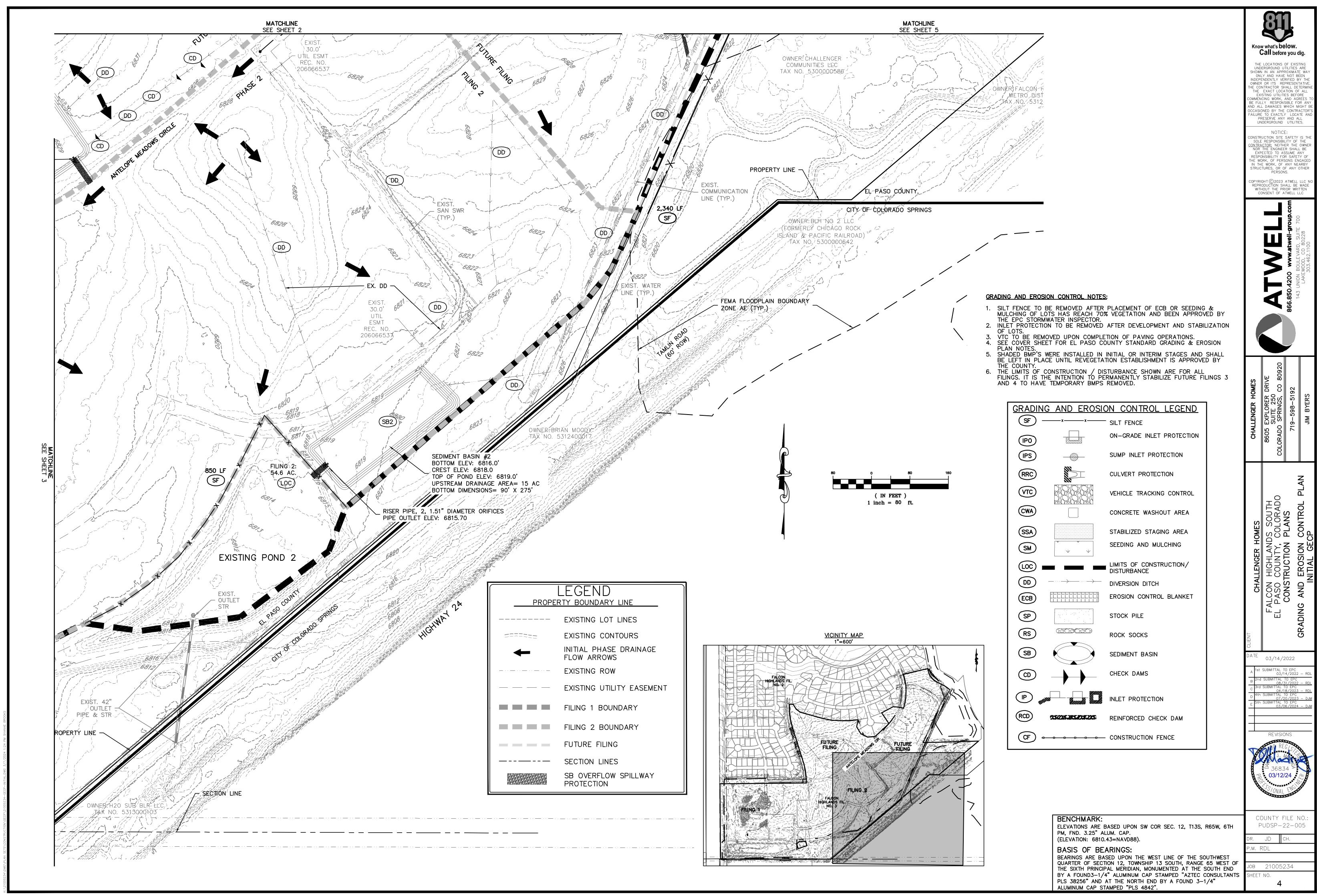
PLS 38256" AND AT THE NORTH END BY A FOUND 3-1/4"

ALUMINUM CAP STAMPED "PLS 4842".

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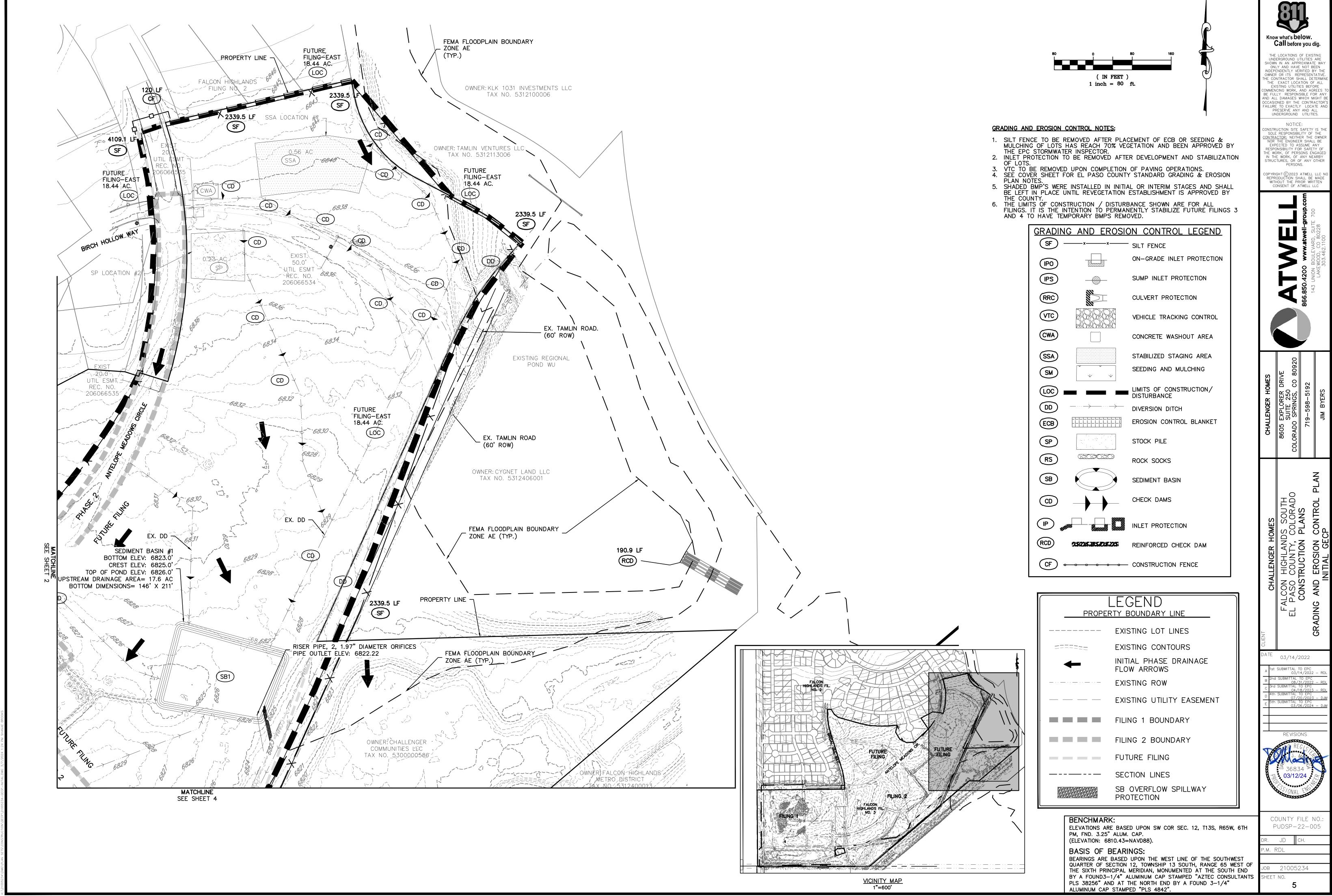


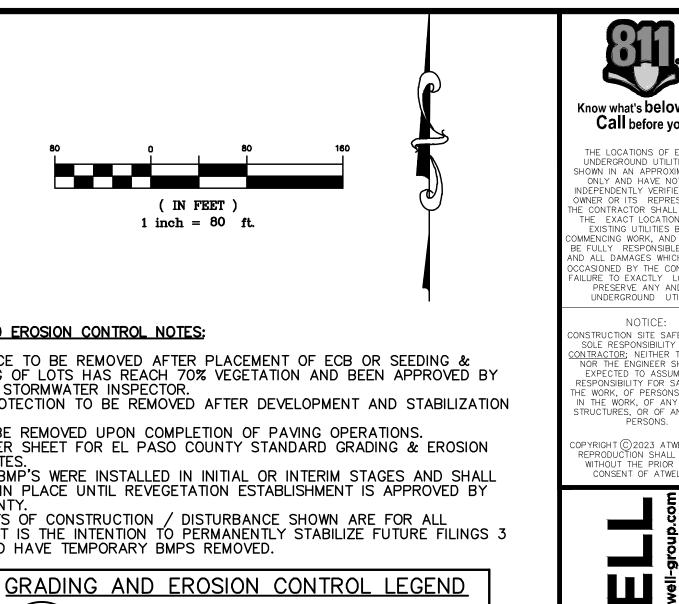


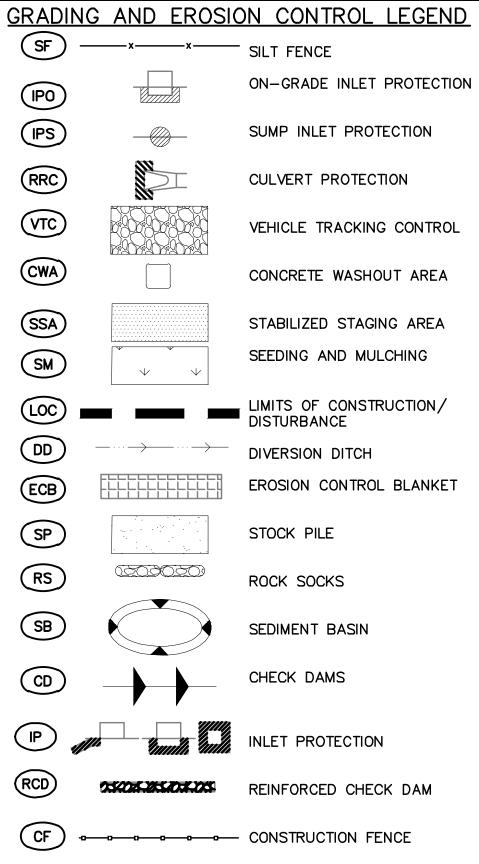


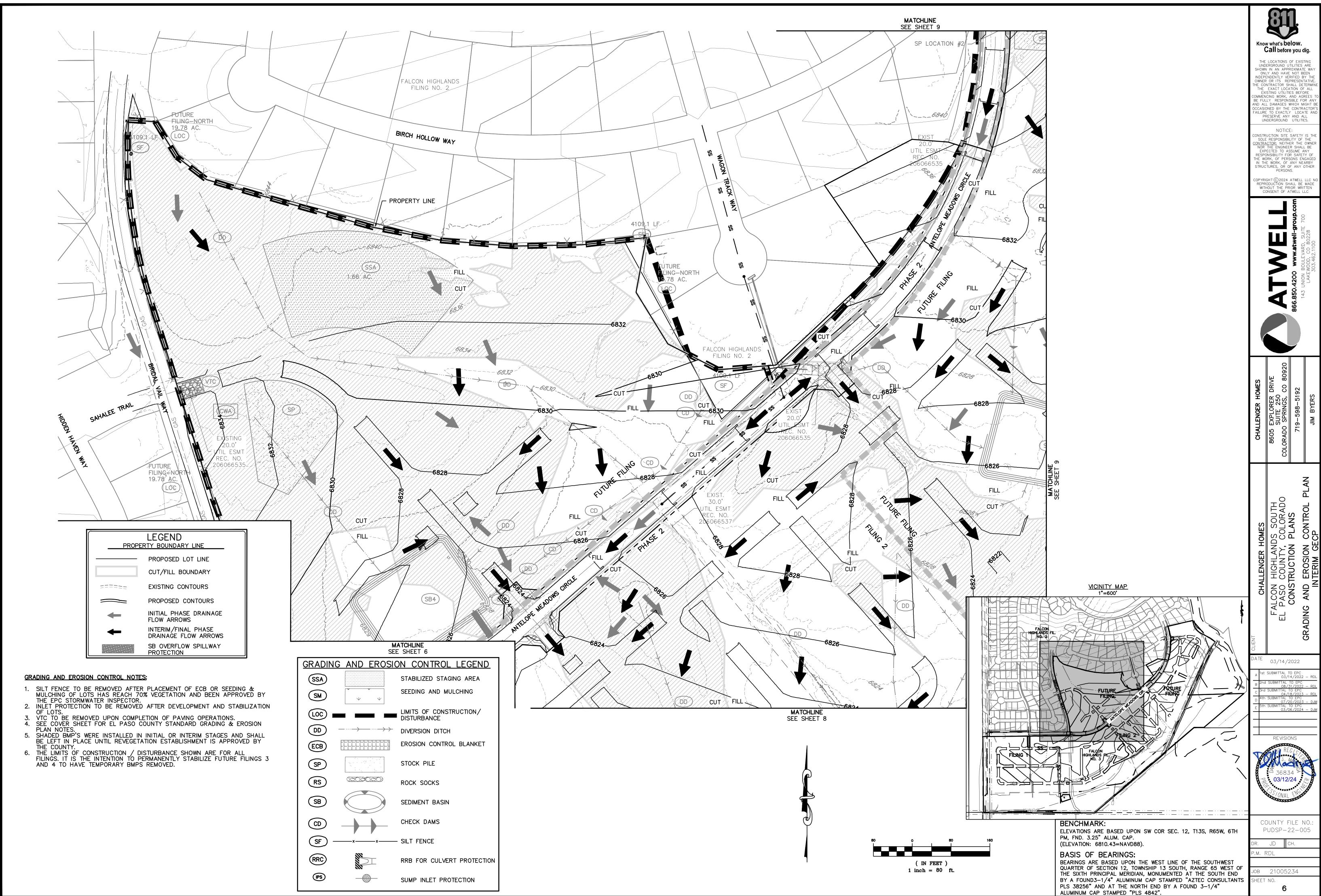
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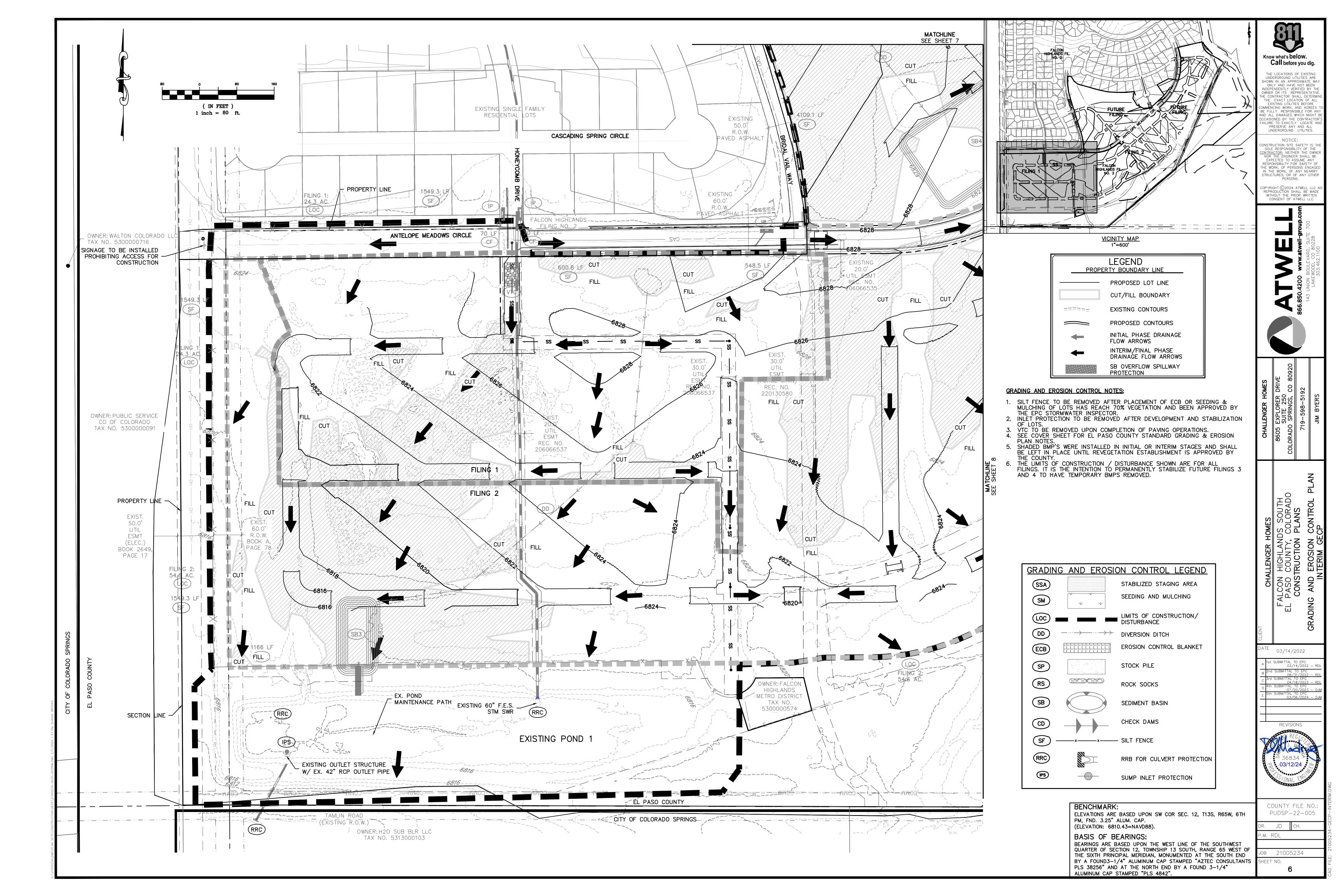


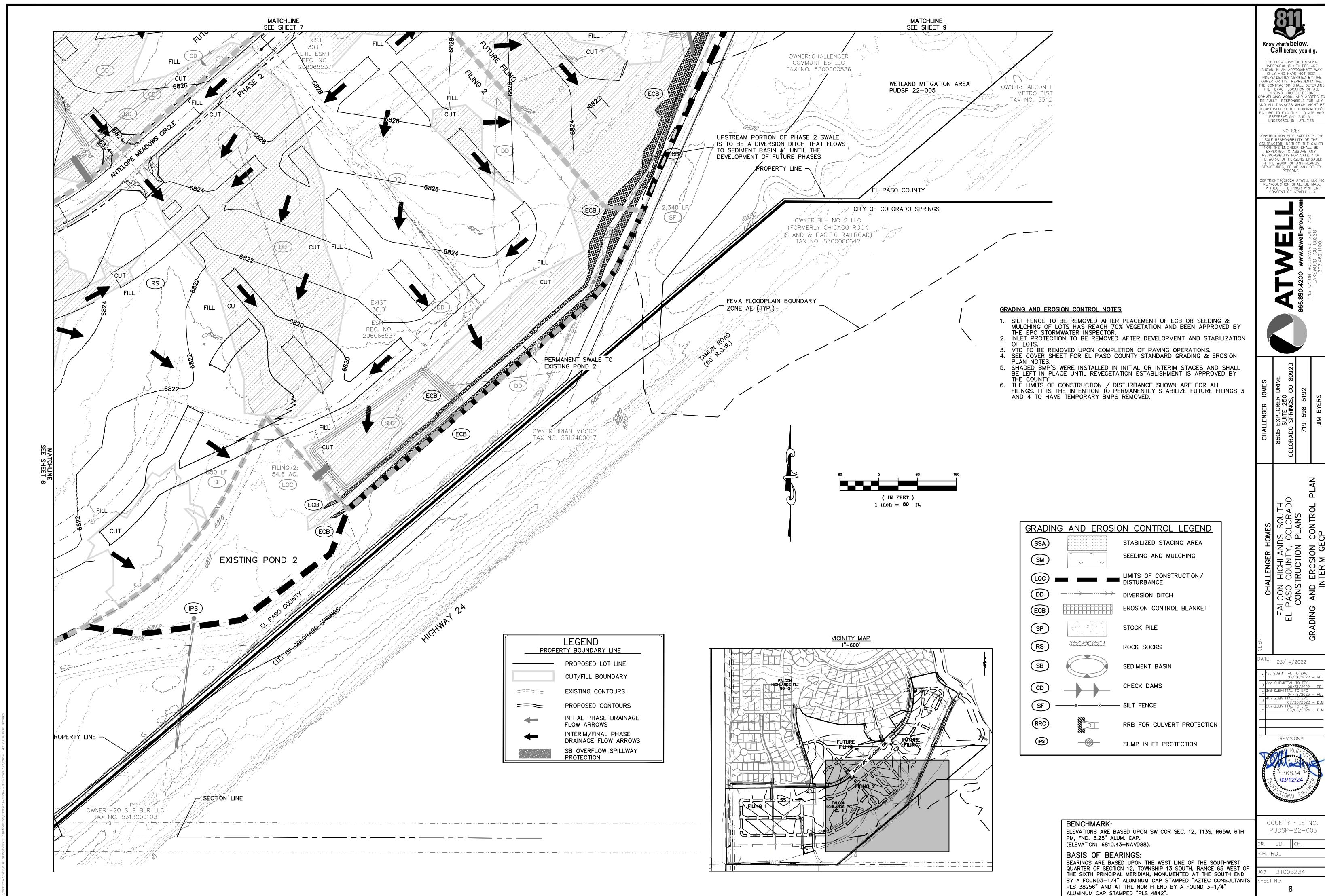


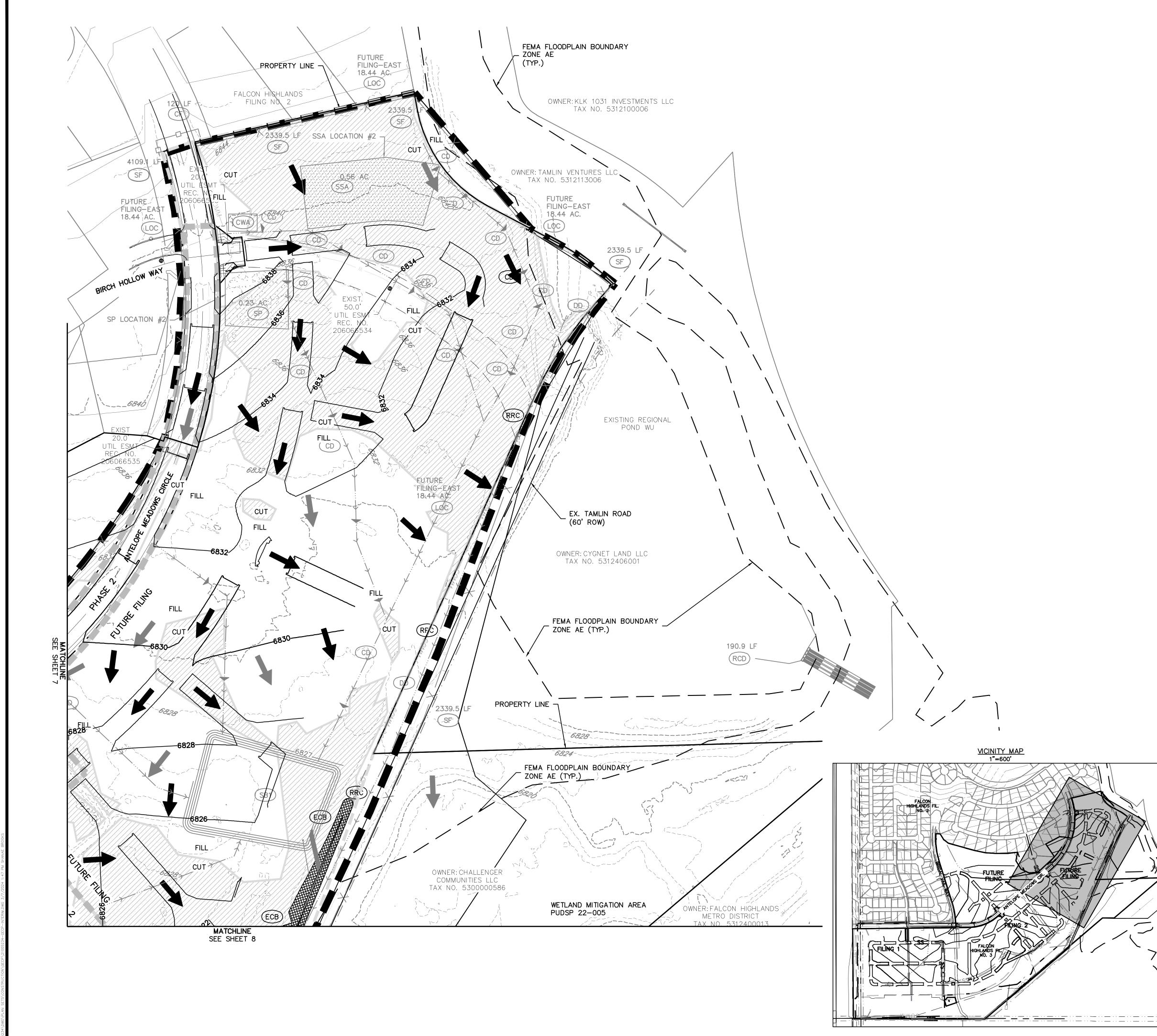




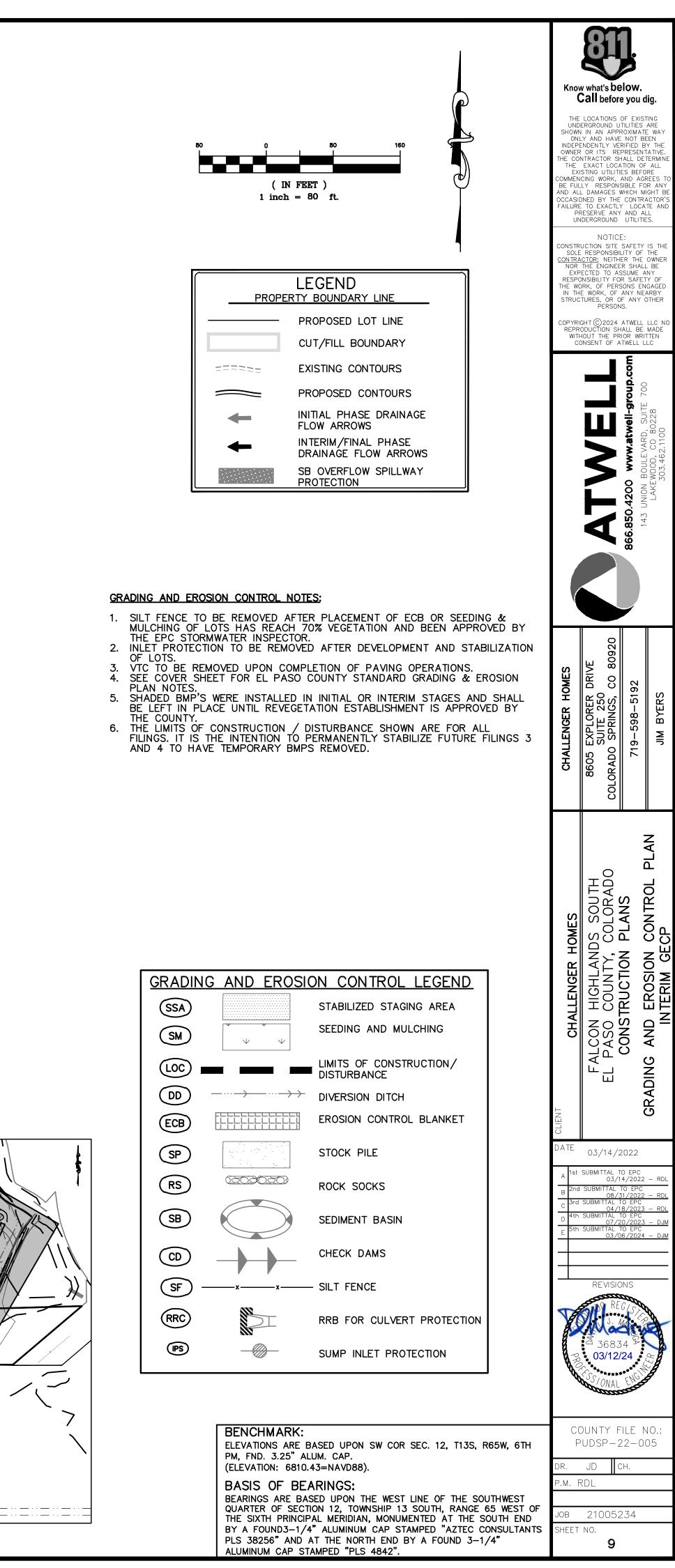
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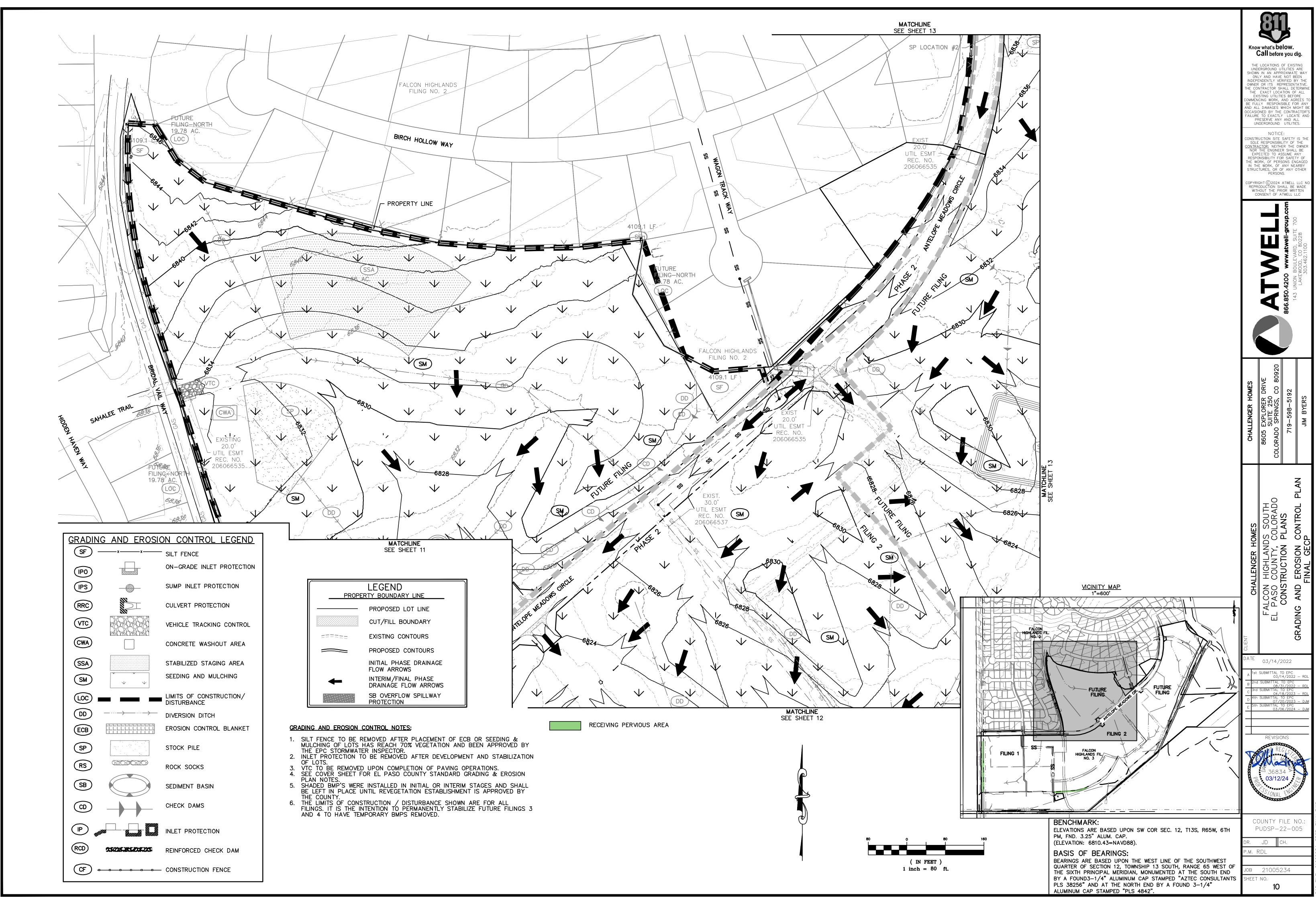




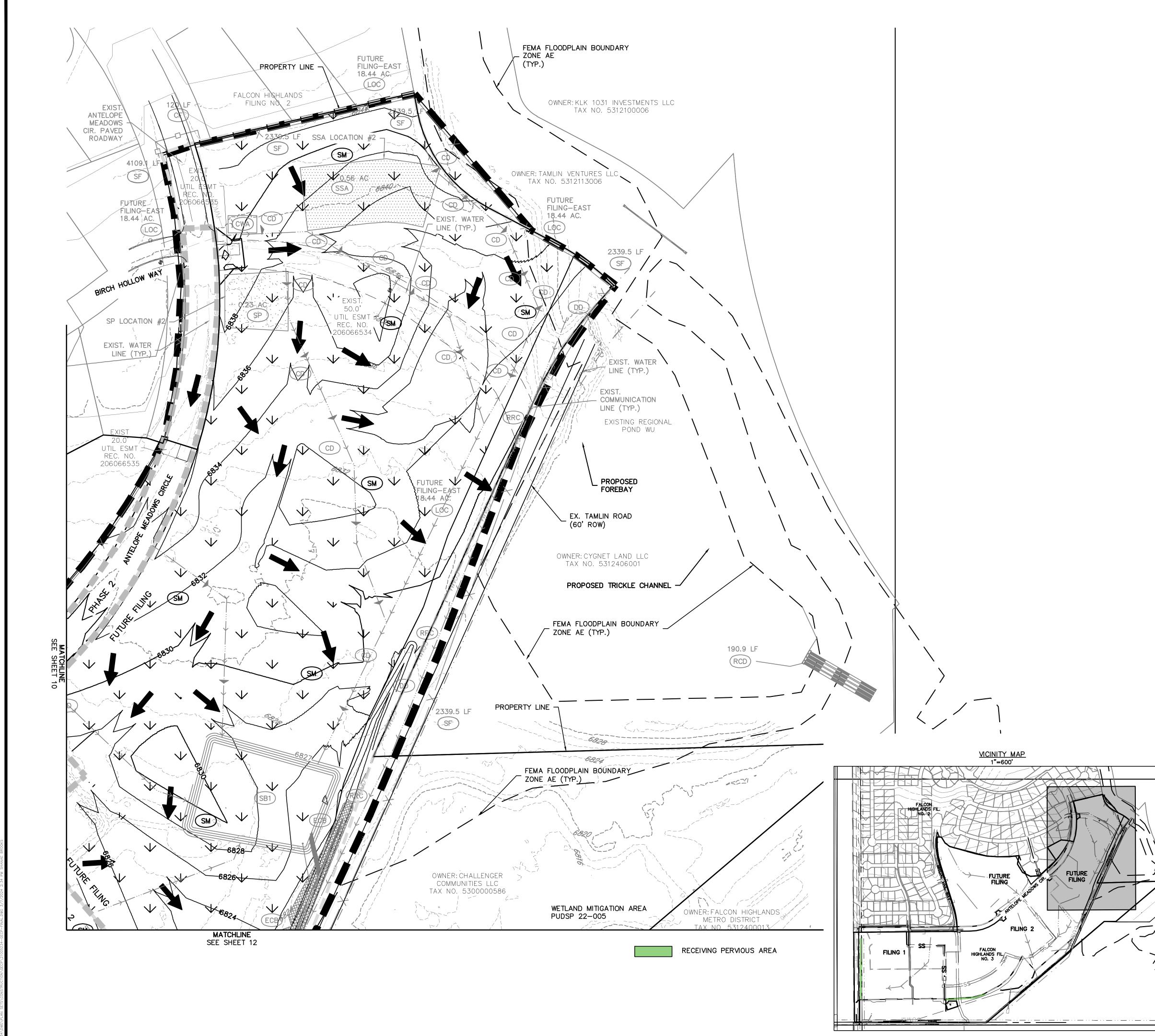


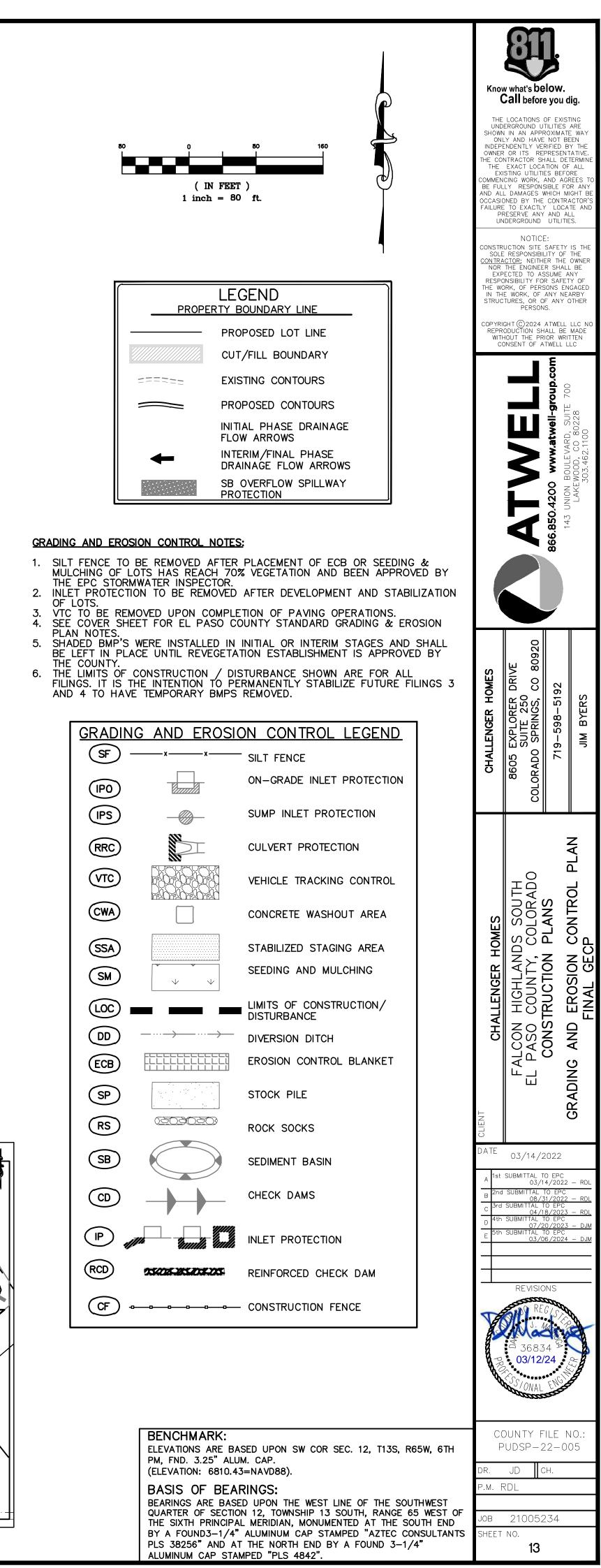




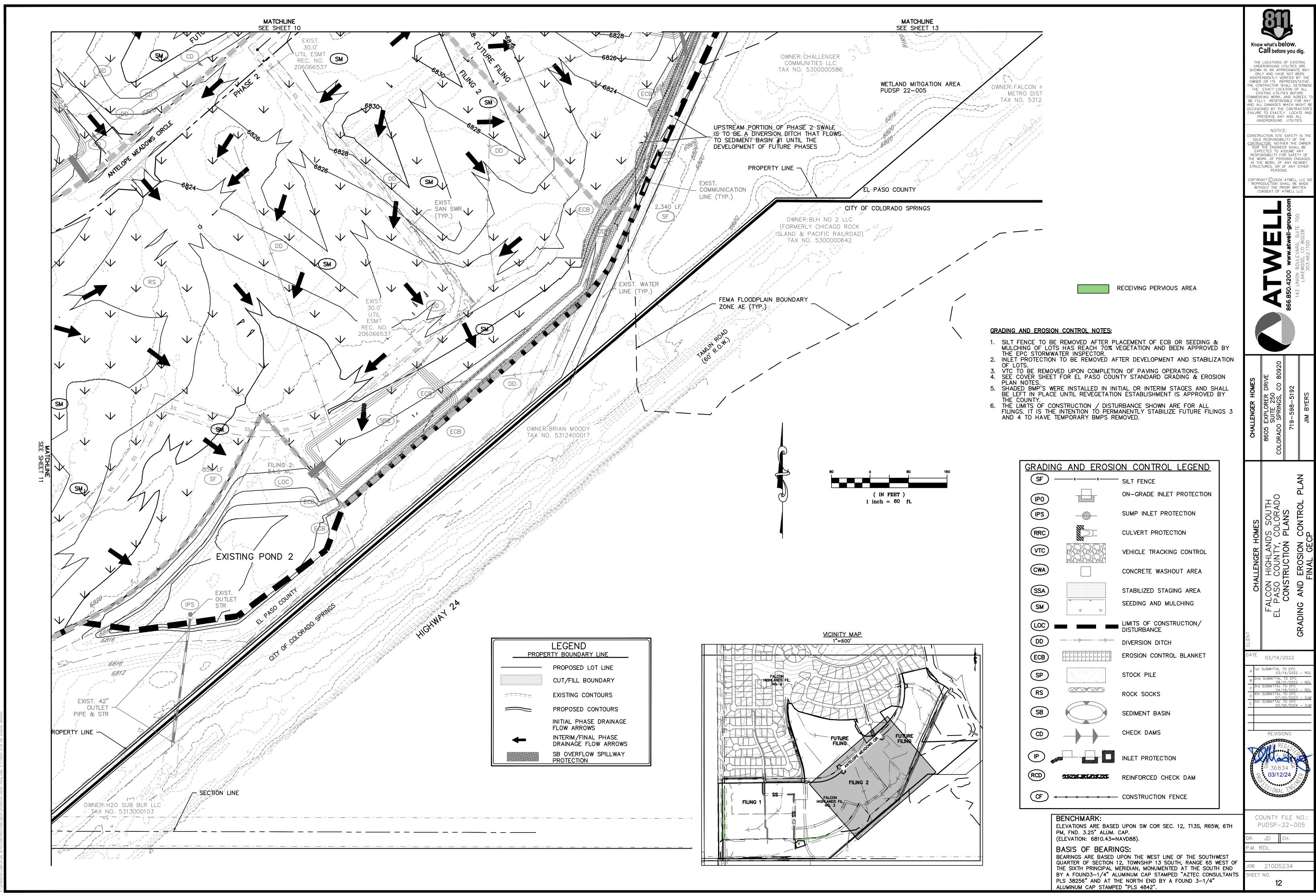


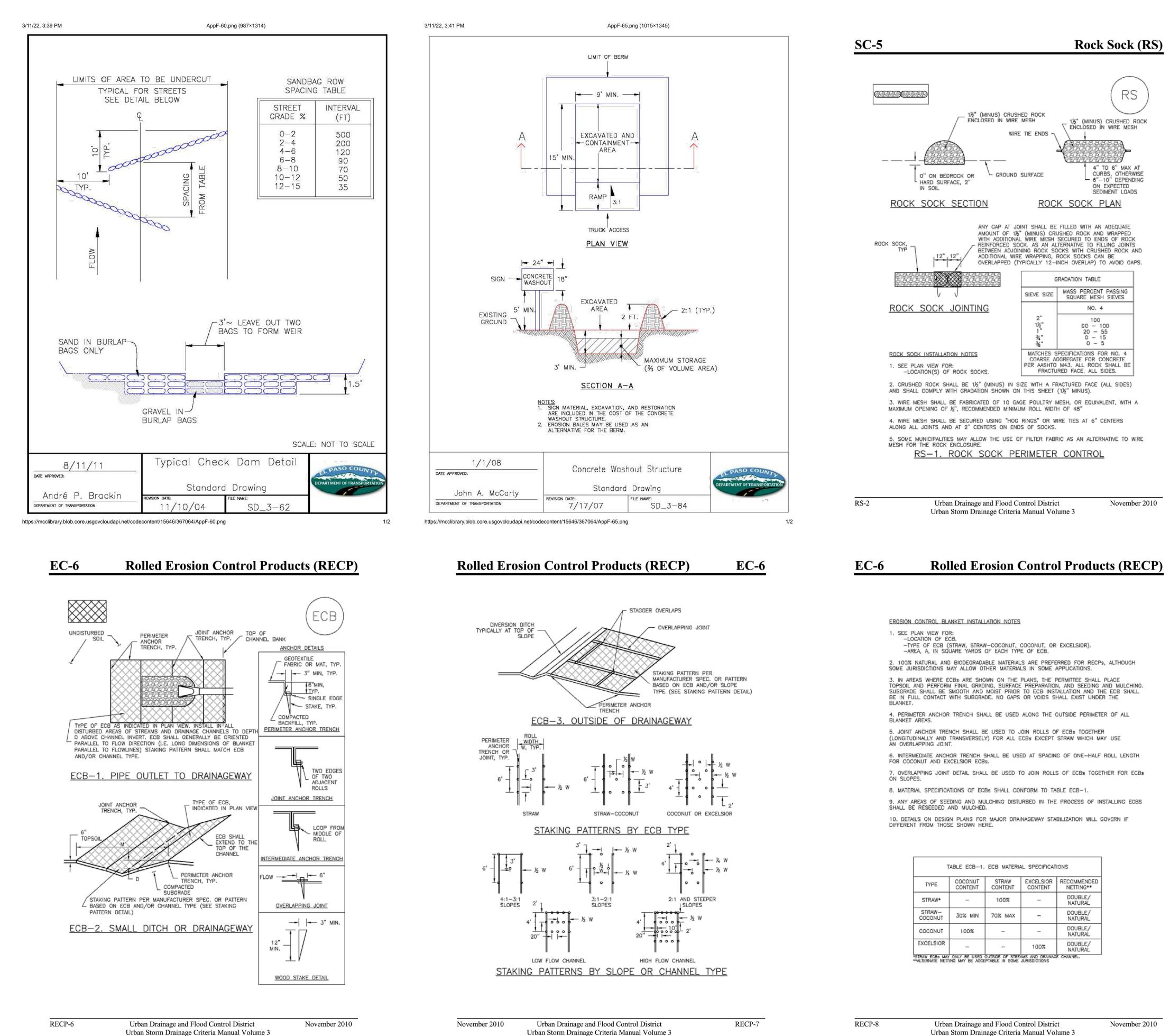




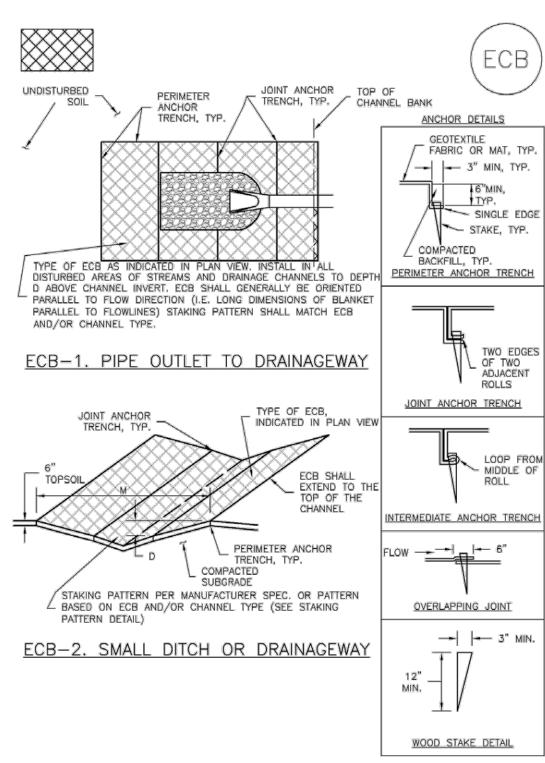


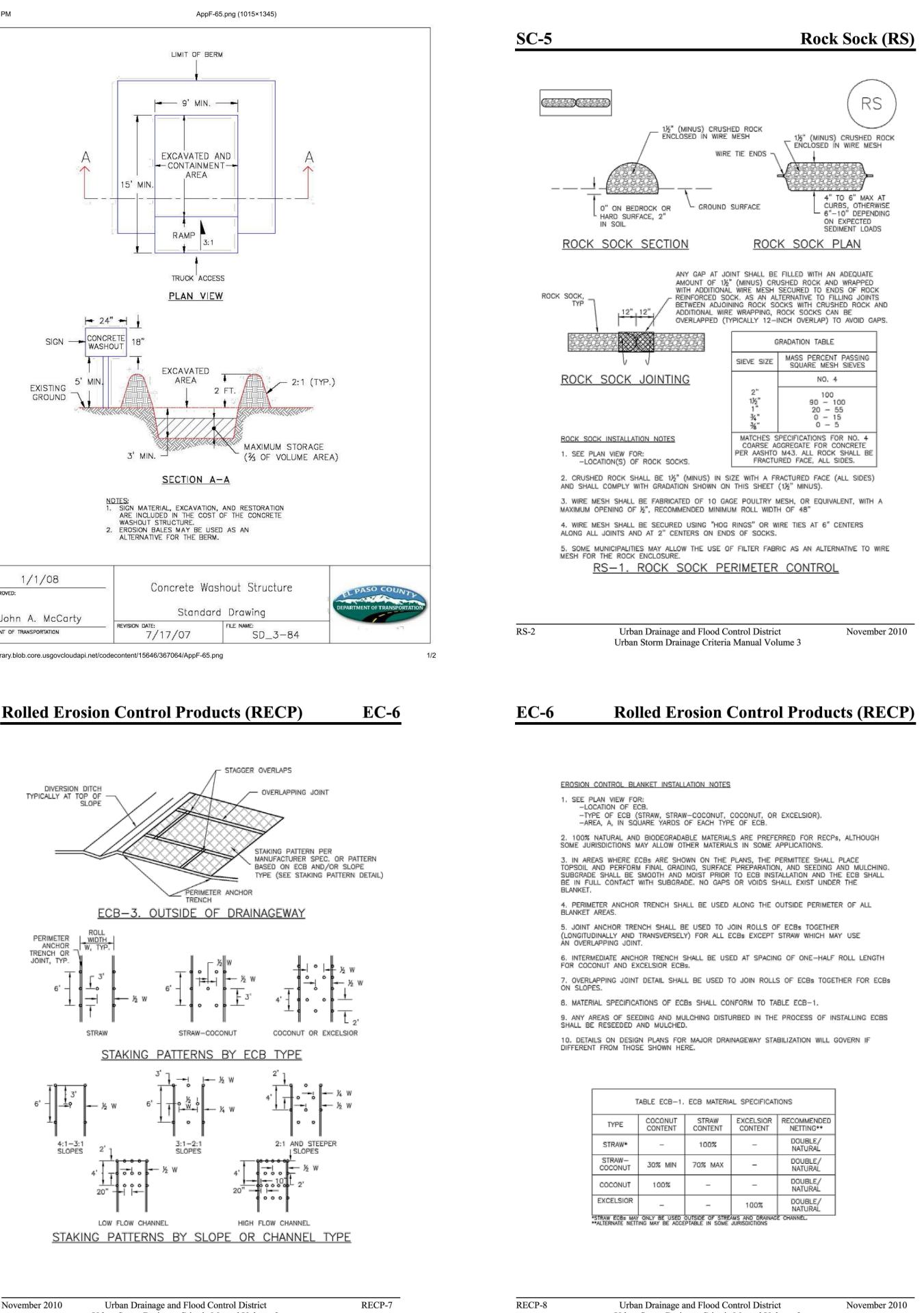


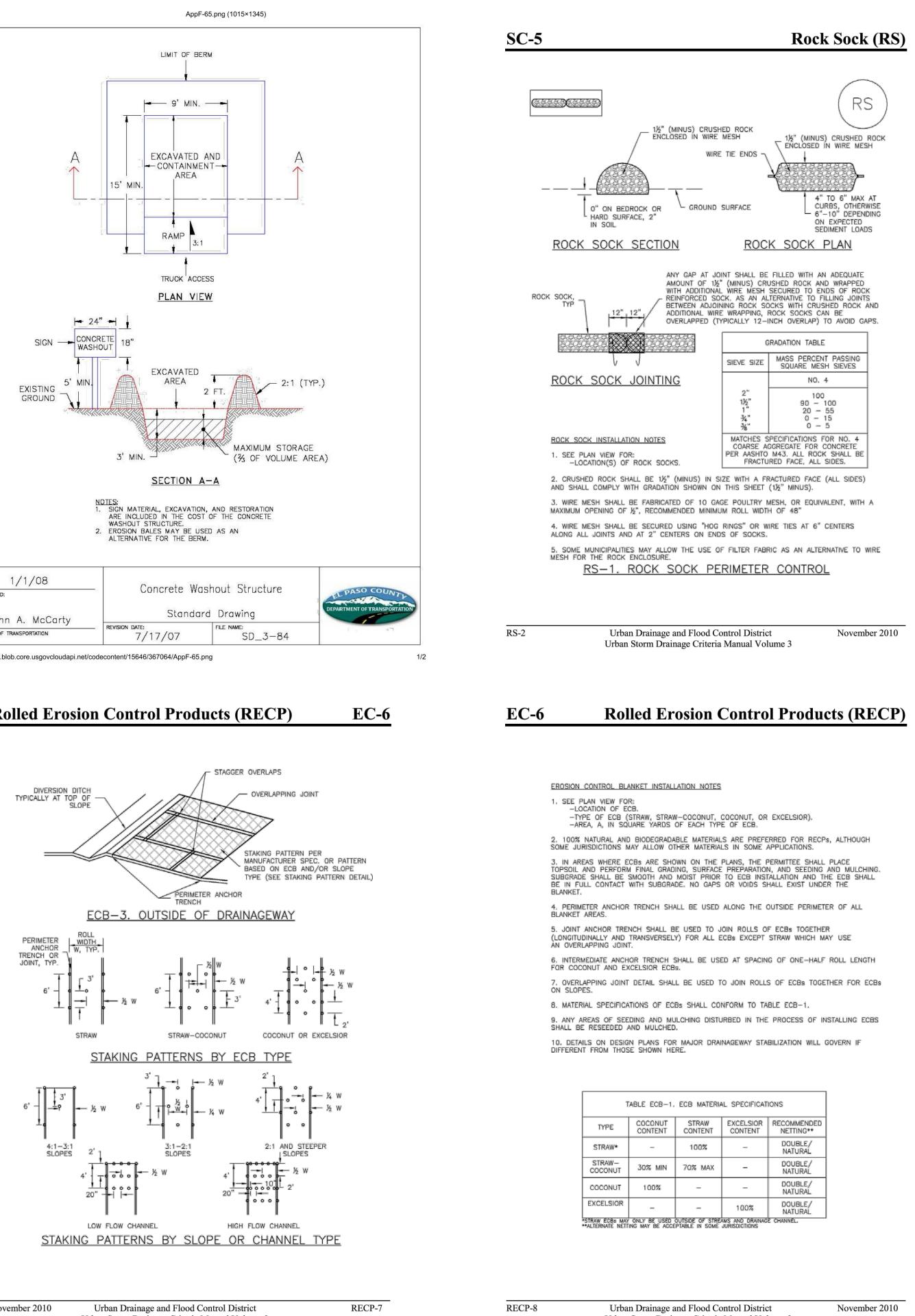


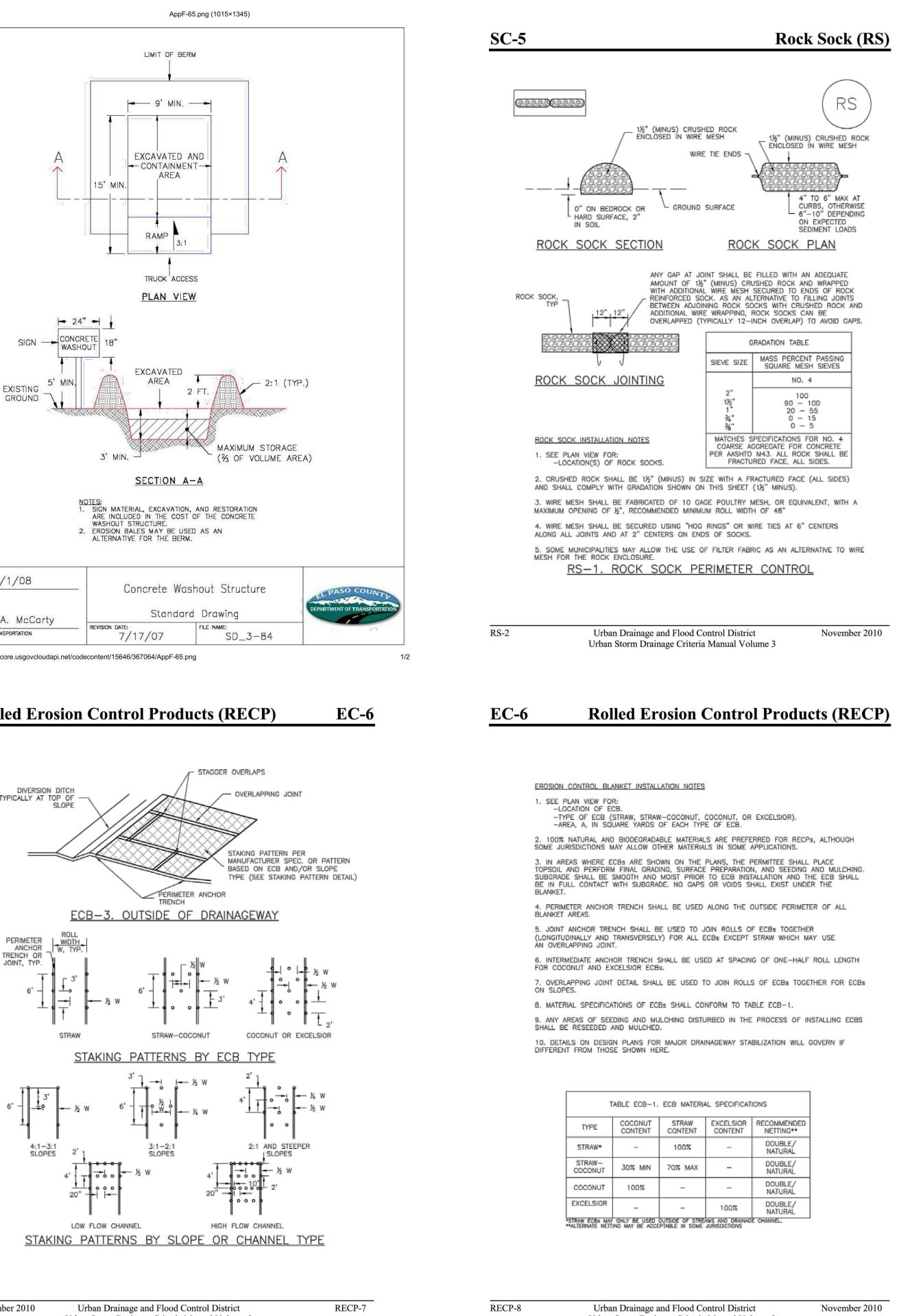


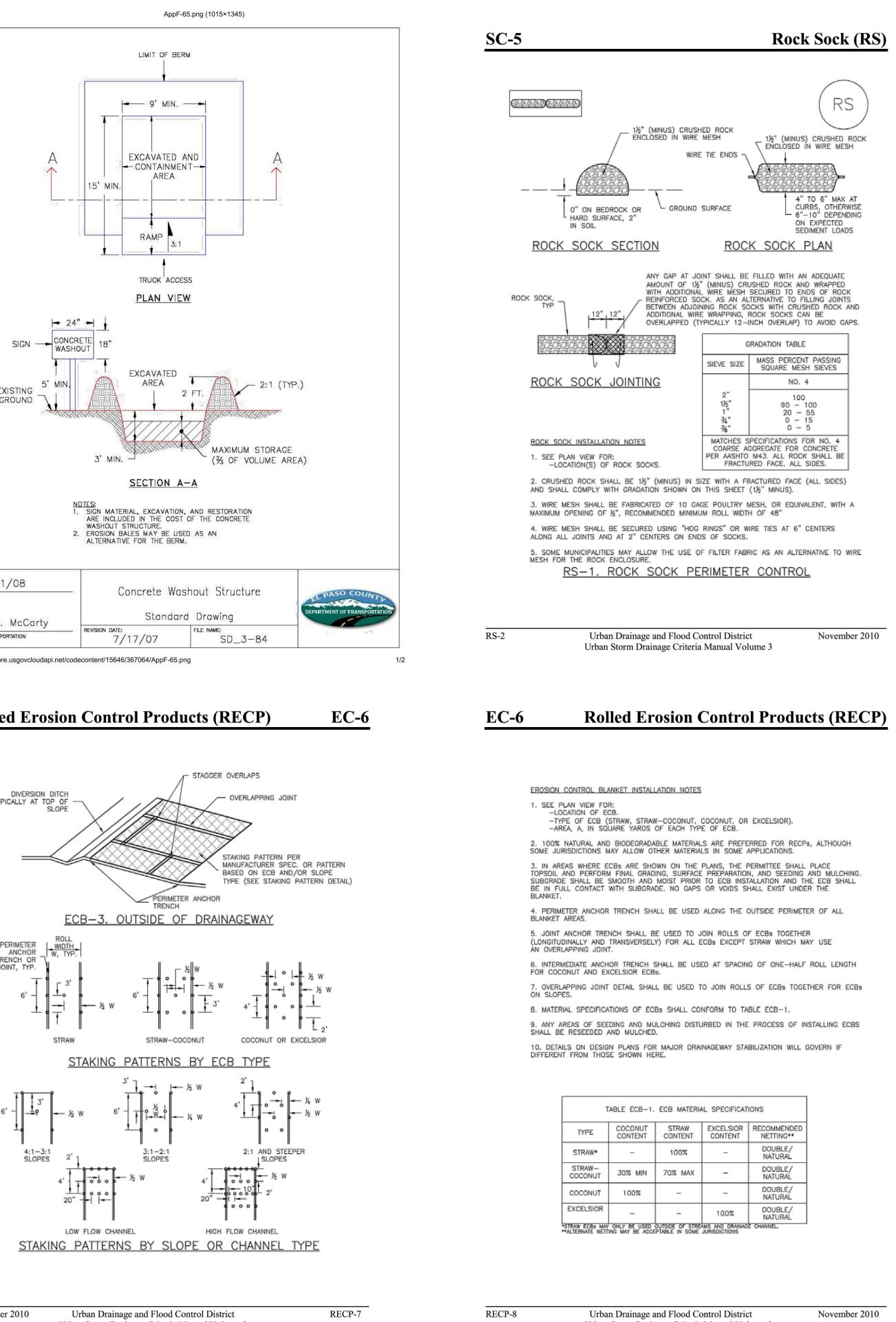












### Rock Sock (RS)

Rock Socl	<b>x (RS)</b>	SC-5
ROCK S	OCK MAINTENANCE NOTES	
MAINTEN POSSIBL	ECT BMP'S EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPE IANCE OF BMP'S SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT E E (AND ALWAY'S WITHIN 24 HOURS) FOLLOWING A STORM THAT CA I, AND PERFORM NECESSARY MAINTENANCE.	BMPs AS SOON AS
EFFECTIV	UENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAIN VE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURE INTED THOROUGHLY.	
	RE BMPS HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITI RY OF THE FAILURE.	IATED UPON
	SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, REPAIR.	OR DAMAGED
MAINTAIN	MENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOV I FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUM OXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.	
	SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURE ED AND APPROVED BY THE LOCAL JURISDICTION.	BED AREA IS
	N ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE , SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED CTION.	
(DETAIL AD	APTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVA	ILABLE IN AUTOCAD)
CONSUL	MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD 3 T WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE US NCES ARE NOTED.	
METHOD MANY O NOR DIS PROPRIE BE INCL	HE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY U S OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AF THER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFOD N SCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVE TARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE N UDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAIN MANUFACTURER'S DETAILS.	REA. THERE ARE IEITHER NDORSES ER, IN THE EVENT MANUFACTURER MUST
ovember 2010	Urban Drainage and Flood Control District	RS-3
	Urban Storm Drainage Criteria Manual Volume 3	
Rolled Er	osion Control Products (RECP)	EC-
		_
FROSION	CONTROL BLANKET MAINTENANCE NOTES	
1. INSPE MAINTEN POSSIBL	ECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPE ANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT E E (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CA	3MPs AS SOON AS
2. FREQ EFFECTIV	I, AND PERFORM NECESSARY MAINTENANCE. QUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINT VE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURE INTED THOROUGHLY.	
3. WHER	RE BMPS HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITI RY OF THE FAILURE.	IATED 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)

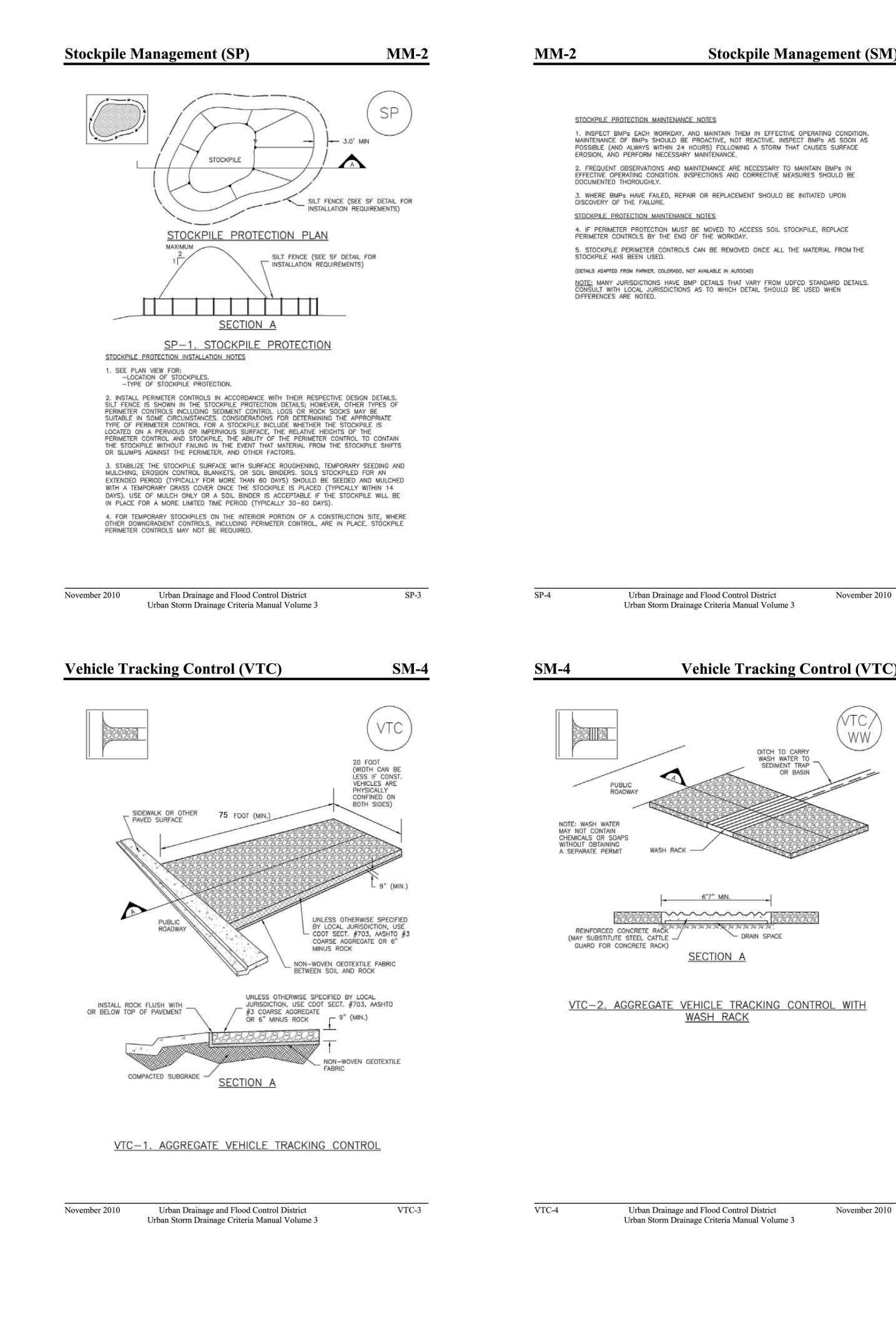
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November 2010

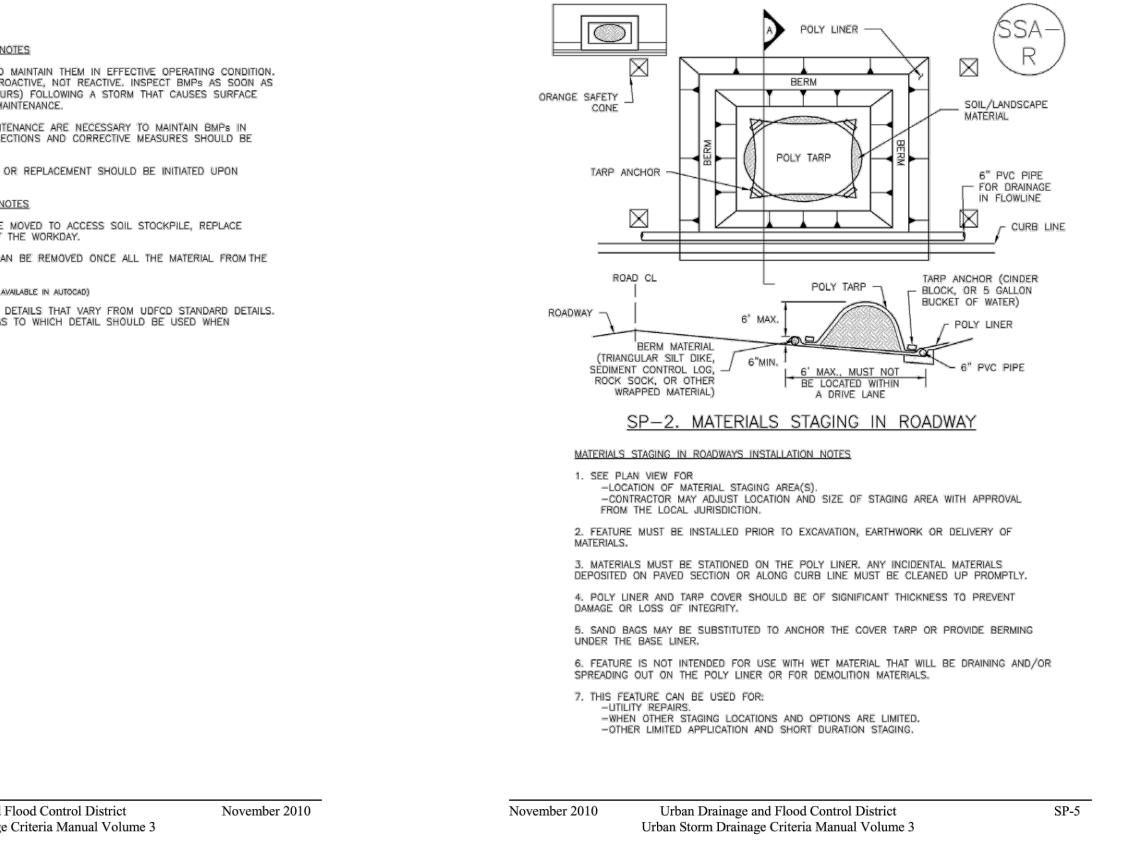
Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 RECP-9



### **Stockpile Management (SM)**

### **Stockpile Management (SP)**

**MM-2** 

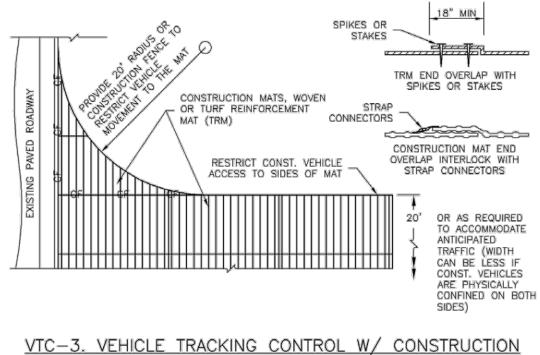


## Vehicle Tracking Control (VTC)

### Vehicle Tracking Control (VTC)

# DISTURBED AREA CONSTRUCTION SITE





MAT OR TURF REINFORCEMENT MAT (TRM)

November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 VTC-5

**SM-4** 

### **Stockpile Management (SM)**

MATERIALS STAGING IN ROADWAY 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. INSPECT PVC PIPE ALONG CURB LINE FOR CLOGGING AND DEBRIS. REMOVE OBSTRUCTIONS PROMPTLY 5. CLEAN MATERIAL FROM PAVED SURFACES BY SWEEPING OR VACUUMING.

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 AURORA, COLORADO)

SP-6

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**SM-4** 

### Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S). -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS. 3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK. STABILIZED CONSTRUCTION ENTRANCE/EXIT 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.

ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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 CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

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Know what's **below**.

Call before you dig.

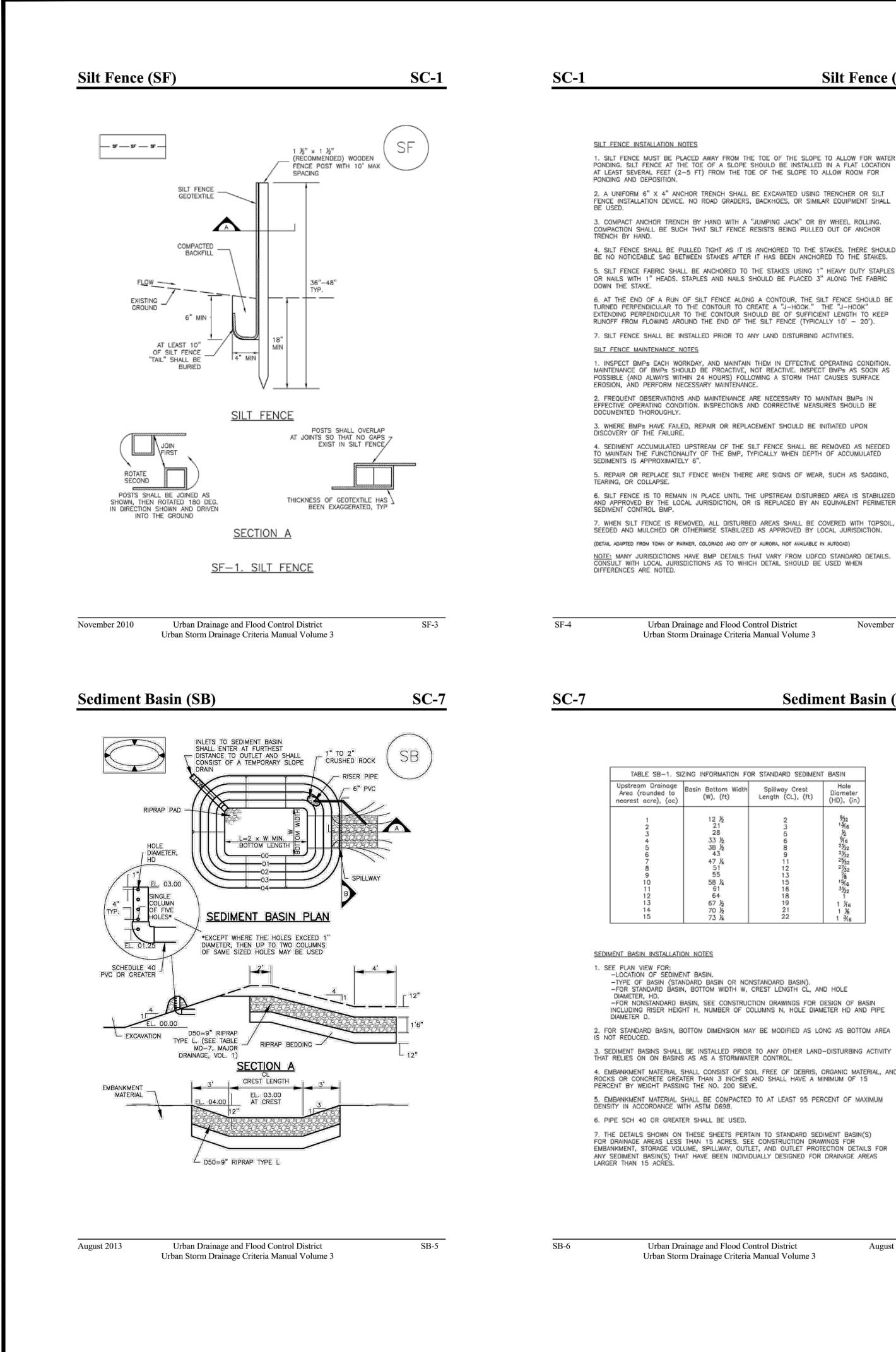
THE LOCATIONS OF EXISTIN UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE W ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY T OWNER OR ITS REPRESENTATI

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VTC-6

Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

November 2010



Silt Fence (SF)	Stabilized Staging Area (SSA)	SM-6
I <u>ON NOTES</u> BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION	ONSITE ONSTRUCTION VEHICLE PARKING (IF	TION (SSA)
ET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR TION. +" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT		
DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL		. THICKNESS
E SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR	STABILIZED CONSTRUCTION ENTRANCE (SEE	AR MAIERIAL
BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES, THERE SHOULD AG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.	DETAILS VTC-1 TO VTC-3)	INCE OR CONSTRUCTION
SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES ADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC	FENCIN	G AS NEEDED
RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE IR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" JLAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP 3 AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').	EXISTING ROADWAY <u>SSA-1. STABILIZED STAGING ARE</u> STABILIZED STAGING AREA INSTALLATION NOTES	ĒA
BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.	1. SEE PLAN VIEW FOR	
CE_NOTES	-LOCATION OF STAGING AREA(S). -CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING ARE/ FROM THE LOCAL JURISDICTION.	A WITH APPROVAL
HWORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE M NECESSARY MAINTENANCE.	2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEED OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING COM	
TIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE	<ol> <li>STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS</li> <li>THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" TH MATERIAL.</li> </ol>	
FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON LURE.	5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHAL SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.	L CONSIST OF DOT
ATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED MATELY 6".	6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NO FENCE AND CONSTRUCTION FENCING.	T LIMITED TO SILT
E SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING,	STABILIZED STAGING AREA MAINTENANCE NOTES	
 REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED E LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER IP.	MAINTENANCE OF BMPS SHOULD BE PROACTIVE, NOT REACTIVE. INSPEC POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT EROSION, AND PERFORM NECESSARY MAINTENANCE.	T BMPs AS SOON AS
S REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.	<ol> <li>FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MU EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASU DOCUMENTED THOROUGHLY.</li> </ol>	
OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)	3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE I DISCOVERY OF THE FAILURE.	NITIATED UPON
ONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN ED.	4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTI UNDERLYING SUBGRADE BECOMES EXPOSED.	NG OCCURS OR
n Drainage and Flood Control District November 2010 Storm Drainage Criteria Manual Volume 3	November 2010Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3	SSA-3

Sediment Basin (SB)

SEDIMENT BASIN MAINTENANCE NOTES

BELOW THE SPILLWAY CREST).

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

LOCAL JURISDICTION.

EROSION, AND PERFORM NECESSARY MAINTENANCE.

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

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

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

4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY

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.

### Sediment Basin (SB)

I. SIZ	ING INFORMATION F	OR STANDARD SEDIMENT	BASIN
ige to ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
	12 ½ 21 28 33 ½ 43 47 ¼ 51 55 58 ¼ 61 64 67 ½ 70 ½ 73 ¼	2 3 5 6 8 9 11 12 13 5 16 18 19 21 22	952 1 N 6 2 N 6 2 N 2 2 N 6 2

-TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN). -FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE -FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

7. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS

> Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

August 2013

August 2013

SB-7

**SC-7** 

### Stabilized Staging Area (SSA)

STABILIZED STAGING AREA MAINTENANCE NOTES

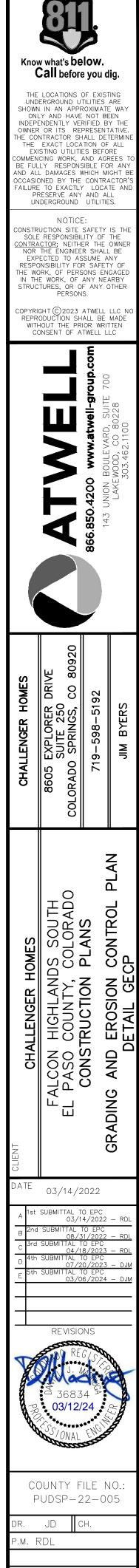
5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

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)



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

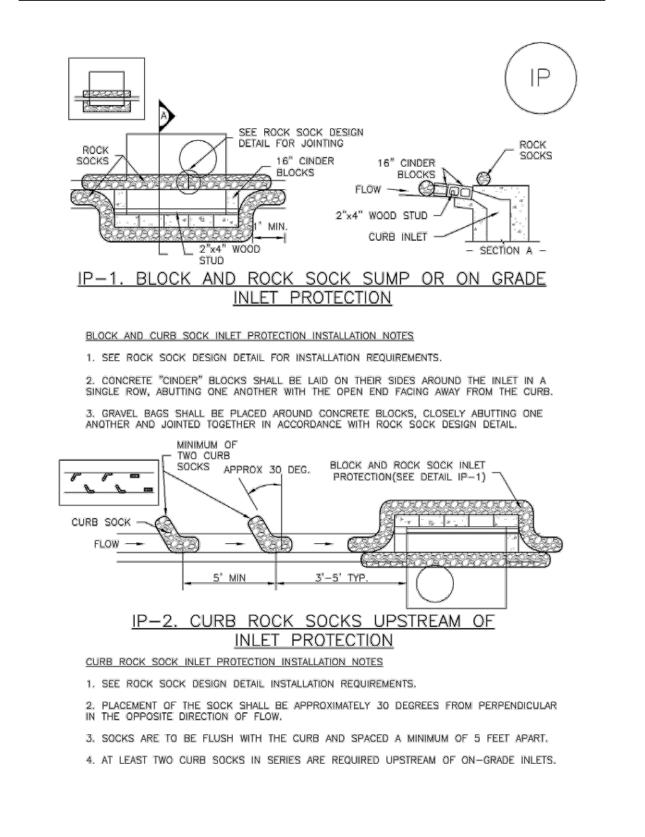


### Inlet Protection (IP)

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— SF —

ROCK SOCK -



Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

**EC-4** 

August 2013

IP-4

SC-6

Mulching (MU)

### Description

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

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

### **Appropriate Uses**

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

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

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

Do not apply mulch during windy conditions.

### **Design and Installation**

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

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

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

Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 MU-1

MU-2

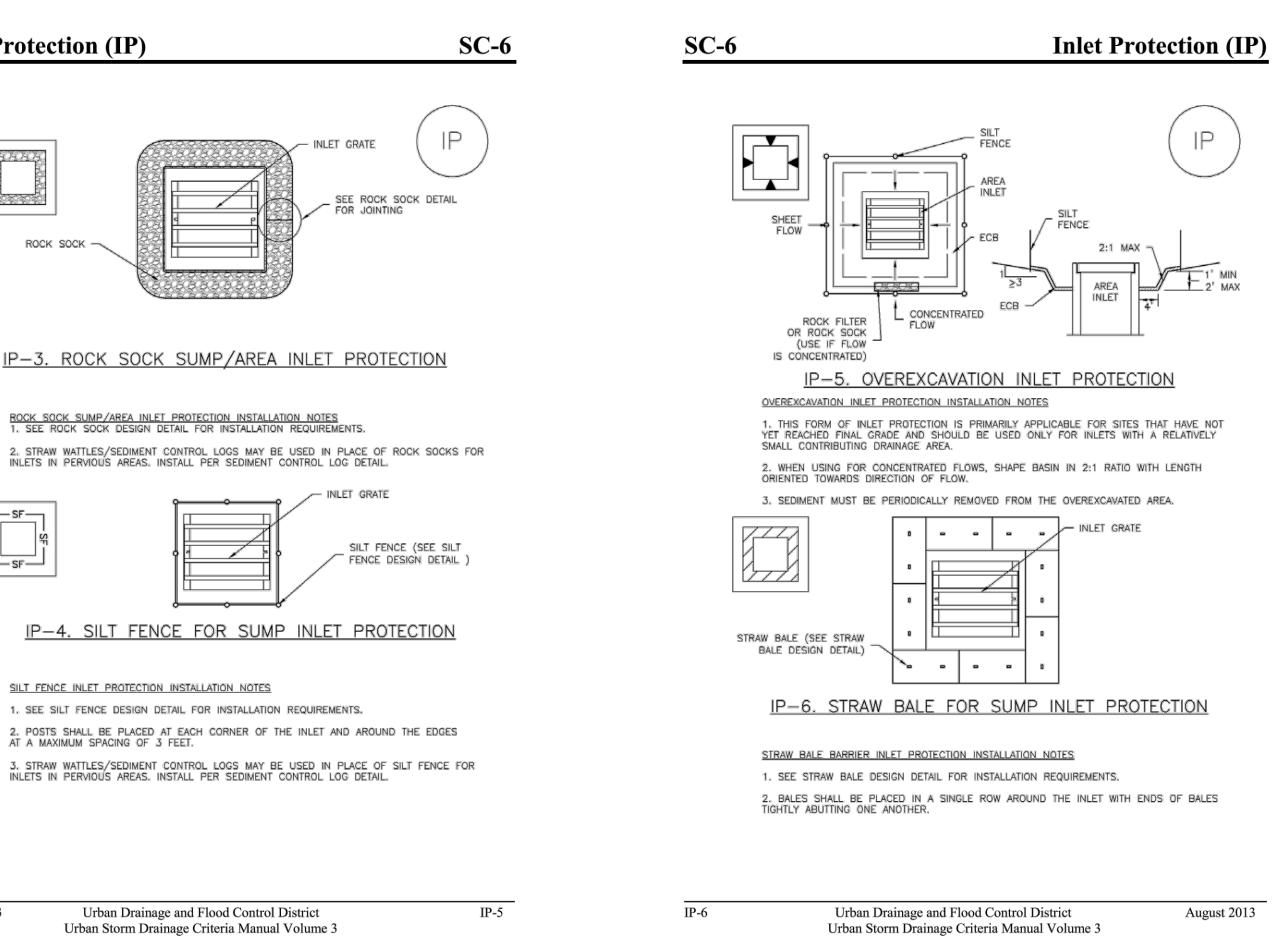
**EC-4** 

August 2013

- have to be weighted to afford proper soil penetration.
- above).
- control blankets anchored with stakes should be used instead of mulch.
- should be avoided.
- of mulch. (See the ECM/TRM BMP for more information.)
- for more information on general types of tackifiers.)
- coverage of exposed soil on the area it is applied.

### **Maintenance and Removal**

needed, to cover bare areas.



**EC-2** 

### Mulching (MU)

 Clean, weed-free and seed-free cereal grain straw should be applied evenly at a rate of 2 tons per acre and must be tacked or fastened by a method suitable for the condition of the site. Straw mulch must be anchored (and not merely placed) on the surface. This can be accomplished mechanically by crimping or with the aid of tackifiers or nets. Anchoring with a crimping implement is preferred, and is the recommended method for areas flatter than 3:1. Mechanical crimpers must be capable of tucking the long mulch fibers into the soil to a depth of 3 inches without cutting them. An agricultural disk, while not an ideal substitute, may work if the disk blades are dull or blunted and set vertically; however, the frame may

 Grass hay may be used in place of straw; however, because hay is comprised of the entire plant including seed, mulching with hay may seed the site with non-native grass species which might in turn out-compete the native seed. Alternatively, native species of grass hay may be purchased, but can be difficult to find and are more expensive than straw. Purchasing and utilizing a certified weed-free straw is an easier and less costly mulching method. When using grass hay, follow the same guidelines as for straw (provided

• On small areas sheltered from the wind and heavy runoff, spraying a tackifier on the mulch is satisfactory for holding it in place. For steep slopes and special situations where greater control is needed, erosion

 Hydraulic mulching consists of wood cellulose fibers mixed with water and a tackifying agent and should be applied at a rate of no less than 1,500 pounds per acre (1,425 lbs of fibers mixed with at least 75 lbs of tackifier) with a hydraulic mulcher. For steeper slopes, up to 2000 pounds per acre may be required for effective hydroseeding. Hydromulch typically requires up to 24 hours to dry; therefore, it should not be applied immediately prior to inclement weather. Application to roads, waterways and existing vegetation

 Erosion control mats, blankets, or nets are recommended to help stabilize steep slopes (generally 3:1 and steeper) and waterways. Depending on the product, these may be used alone or in conjunction with grass or straw mulch. Normally, use of these products will be restricted to relatively small areas. Biodegradable mats made of straw and jute, straw-coconut, coconut fiber, or excelsior can be used instead

• Some tackifiers or binders may be used to anchor mulch. Check with the local jurisdiction for allowed tackifiers. Manufacturer's recommendations should be followed at all times. (See the Soil Binder BMP

 Rock can also be used as mulch. It provides protection of exposed soils to wind and water erosion and allows infiltration of precipitation. An aggregate base course can be spread on disturbed areas for temporary or permanent stabilization. The rock mulch layer should be thick enough to provide full

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

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June 2012

TS/PS-4

Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

**Temporary and Permanent Seeding (TS/PS)** 

Pounds of

Pure Live Seed

(PLS)/acre<sup>c</sup>

35 - 50

25 - 35

25 - 35

10 - 15

3 - 15

20-35

20-35

20-35

25 - 40

Planting

Depth

(inches)

1 - 2

1 - 2

1 - 2

1/2

<sup>1</sup>/<sub>2</sub> = <sup>3</sup>/<sub>4</sub>

1 - 2

1 - 2

1 - 2

1 - 2

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

Growth

Season<sup>®</sup>

Cool

Cool

Cool

Cool

Warm

Cool

Cool

Cool

Cool

is not disturbed or mowed closer than 8 inches.

<sup>a</sup> Successful seeding of annual grass resulting in adequate plant growth will

usually produce enough dead-plant residue to provide protection from

Hydraulic seeding may be substituted for drilling only where slopes are

operation, when practical, to prevent the seeds from being encapsulated in

steeper than 3:1 or where access limitations exist. When hydraulic

seeding is used, hydraulic mulching should be applied as a separate

<sup>b</sup> See Table TS/PS-2 for seeding dates. Irrigation, if consistently applied,

may extend the use of cool season species during the summer months.

percent if done using a Brillion Drill or by hydraulic seeding.

Seeding rates should be doubled if seed is broadcast, or increased by 50

wind and water erosion for an additional year. This assumes that the cover

Species<sup>a</sup>

(Common name)

1. Oats

5. Millet

Spring wheat

Spring barley

Winter wheat

7. Winter barley

Winter rye

9. Triticale

the mulch.

Annual ryegrass

January 2021

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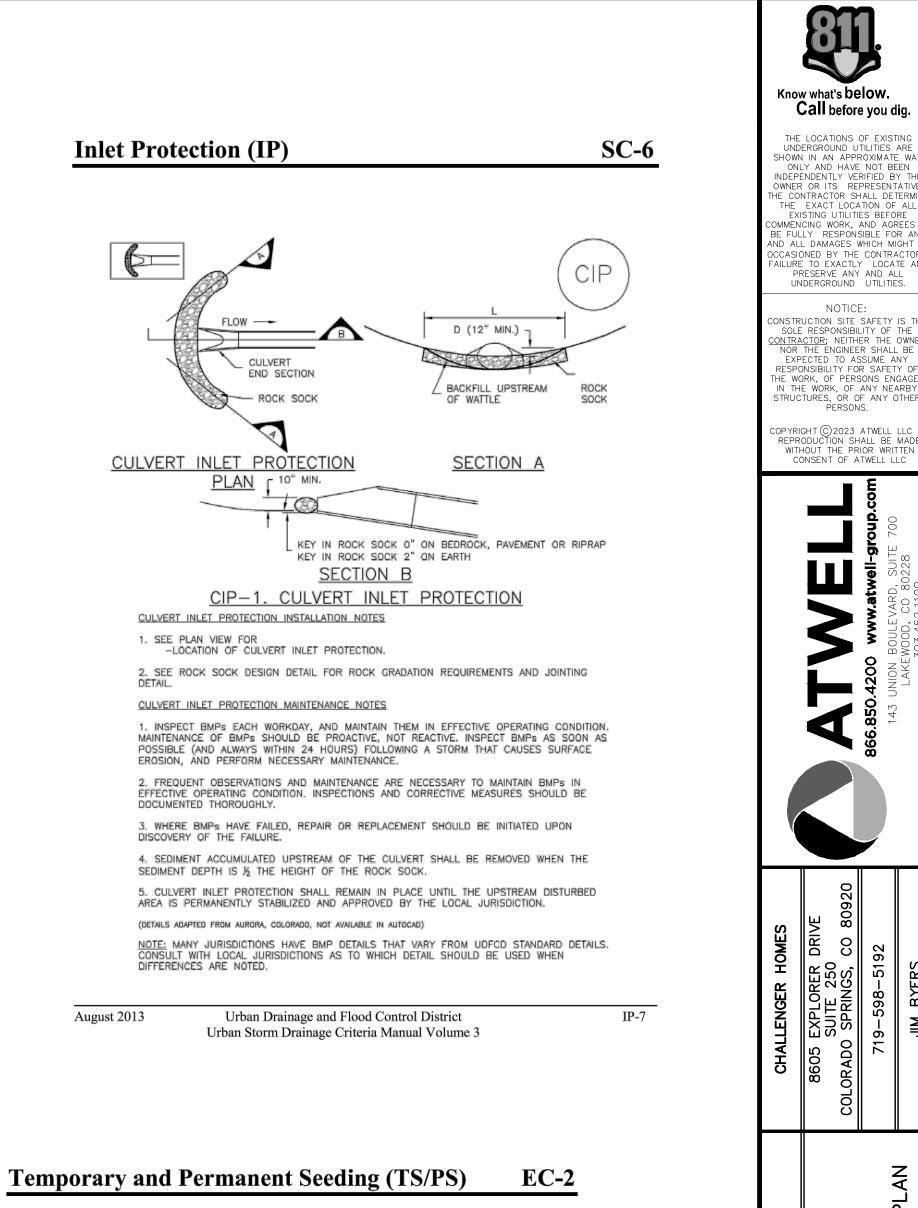


Table TS/PS-2. Seeding Dates for Annual and Perennial Grasses

	(Numbers in t	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		1,2,3	~	√	
May 1–May 15			✓		
May 16–June 30	5				
July 1–July 15	5				
July 16–August 31					
September 1–September 30		6, 7, 8, 9			
October 1-December 31			~	$\checkmark$	

### 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 USDCM Volume 2 Revegetation Chapter and Volume 3 Mulching BMP Fact Sheet (EC-04) 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.

If a temporary annual seed was planted, the area should be reseeded with the desired perennial mix when there will be no further work in the area. To minimize competition between annual and perennial species, the annual mix needs time to mature and die before seeding the perennial mix. To increase success of the perennial mix, it should be seeded during the appropriate seeding dates the second year after the temporary annual mix was seeded. Alternatively, if this timeline is not feasible, the annual mix seed heads should be removed and then the area seeded with the perennial mix.

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. Resed 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.

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Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 TS/PS-5

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