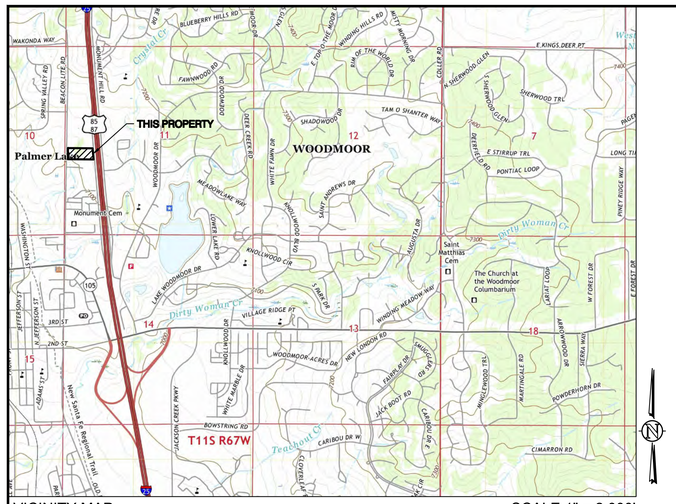
TRAILERS DIRECT EXPRESS

Located in the West 1/2 of the West 1/2 of Section 11,
Township 11 South, Range 67 West of the 6th P.M.,
Town of Monument, El Paso County, State of Colorado



VICINITY MAP SCALE 1" = 2,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.
SHOWN VICINITY MAP TAKEN FROM USGS QUAD MAP - MONUMENT 7.5 MIN

LEGAL DESCRIPTION

LEGAL DESCRIPTION SHOWN PER ABC LANDSCAPING WAREHOUSE/OUTDOOR STORAGE FILING NO. 1 (RECEPTION NUMBER 220714597).

THAT PORTION OF THE SW 1/4 OF SECTION 11 IN TOWNSHIP 11 SOUTH, RANGE 67 WEST OF THE 6TH P.M., DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 11; THENCE EAST ON THE NORTH LINE OF SAID SECTION A DISTANCE OF 30 FEET; THENCE SOUTH PARALLEL WITH THE WEST LINE OF SAID SECTION 11 A DISTANCE OF 2858.63 FEET TO THE POINT OF BEGINNING OF THE TRACT TO BE DESCRIBED HEREBY; THENCE SOUTH PARALLEL WITH THE WEST LINE OF SAID SECTION 11 A DISTANCE OF 311.33 FEET; THENCE S 89 DEGREES 51' E 716.52 TO A POINT, SAID POINT BEING ON THE WESTERLY RIGHT OF WAY LINE OF U.S. HIGHWAYS NO. 85-87; THENCE N 5 DEGREES 42' W ON SAID RIGHT OF WAY LINE 312.95 FEET TO INTERSECT A LINE DRAWN S 89 DEGREES 51' E FROM THE POINT OF BEGINNING; THENCE N 89 DEGREES 51' W 684.53 FEET TO THE POINT OF BEGINNING, EL PASO COUNTY, COLORADO.

SAID PARCELS CONTAIN 5.0 ACRES OF LAND, MORE OR LESS.

BASIS OF BEARING & PROJECT BENCHMARK

BASIS OF BEARING: HORIZONTAL COORDINATES ARE BASED UPON THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE.

PROJECT BENCHMARK: ELEVATIONS ARE BASED UPON NGS POINT T395 - A STEEL ROD IN A MONUMENT BOX - WITH AN ELEVATION OF 7111.32.

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0 1	3A	EXISTING CONDITIONS & DEMO PLAN W/ AERIAL
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0	INITIAL RELEASE	MARCH 28, 2022
1	REV PER TOWN COMMENTS 05/02/22	JUNE 20, 2022
2	REV PER TOWN COMMENTS 08/05/22	AUGUST 5, 2022

CONSTRUCTION DOCUMENTS FOR:

TRAILERS DIRECT EXPRESS
18955 BEACON LITE ROAD
MONUMENT, CO 80132

PREPARED FOR:

CRAIG OWEN
2900 S TELEPHONE ROAD
MOORE, OK 73160
(405)701-9927

APPROVED BY:

TRAILERS DIRECT EXPRESS — DATE
CRAIG OWEN

WESTERN ENGINEERING CONSULTANTS, INC. LLC — DATE
CHADWIN F. COX, P.E.

OWNER	APPLICANT	CIVIL ENGINEER	LANDSCAPE ARCHITECT
ABC LANDSCAPING INC. CONTACT: DEAN COUTURE abclandscaping85@gmail.com 3870 MARK DABLING BLVD COLORADO SPRINGS, CO 80907 (719)491-0368	TRAILERS DIRECT EXPRESS CONTACT: CRAIG OWENS craigowens@trailersdirectexpress.com 2900 S TELEPHONE ROAD, SUITE 220 MOORE, OK 73160 (405)701-9927	WESTERN ENGINEERING CONSULTANTS, INC. LLC CONTACT: CHAD COX, P.E. chadwin.cox@westerneci.com 127 S DENVER AVE FORT LUPTON, CO 80621 PHONE: (720)685-9951	NATURAL DESIGN SOLUTIONS, INC. CONTACT: NEIL MCLANE, RLA, CLARB, LEED AP neil@ndscolorado.com (303)443-0388
SURVEYOR	**FIRE DISTRICT**	**SANITATION DISTRICT**	**TOWN**
BAILEY PROFESSIONAL SOLUTIONS CONTACT: ALAN BAILEY, PLS alan@baileyprofessionalsolutions.com (303)587-1672	TRI-LAKES MONUMENT FIRE DISTRICT 16055 OLD FOREST POINT, SUITE 103 MONUMENT, CO 80132 (719)484-0911	MONUMENT SANITATION DISTRICT 130 SECOND ST, P.O. BOX 205 MONUMENT, CO 80132 (719)481-4886	TOWN OF MONUMENT CONTACT: DEBBIE FLYNN, PLANNER II 645 BEACON LITE ROAD MONUMENT, CO 80132 Dflynn@tomgov.com (719)488-1604

UNCC
CALL BEFORE
YOU DIG
1-800-922-1987
Utility Notification
Center of Colorado
Administrative Office
16361 Table Mountain Parkway Golden, Colorado 80403
Office: 303-232-1991 Fax: 303-234-1712
Toll-Free: 1-800-922-1987

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

PREPARED BY:
Western Engineering Consultants, Inc. LLC
WESTERN ENGINEERING CONSULTANTS, INC. LLC
127 S. DENVER AVENUE, FORT LUPTON, CO 80621
720-685-9951 PH, 720-294-1330 FAX, email@westerneci.com

PROJECT NO: 01-0415.001.00
INITIAL PLAN RELEASE: AUGUST 5, 2022
SHEET: 1 of 29

T:\0415_001_00-TRAILERS DIRECT EXPRESS\Dwg\Cds\0415-001-WEC-CDS.dwg, 01-COVER, 8/3/2022 6:17:10 PM, DWG To PDF.pc3

ALL REFERENCES HERE-IN THIS PLAN NOTED AS "CITY", "COUNTY", OR "TOWN" SHALL BE INTERPRETED AS MEANING THE TOWN OF MONUMENT.

SUPPLEMENTAL CONSTRUCTION NOTES

(TOWN OF MONUMENT NOTES & REQUIREMENTS SHALL GOVERN)

GENERAL CONSTRUCTION NOTES:

1. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY, OR EASEMENT, SHALL CONFORM TO WELD COUNTY CONSTRUCTION SPECIFICATIONS AND DESIGN STANDARDS. IN THE CASE SUCH STANDARDS ARE NOT PROVIDED, CDOT STANDARDS SHALL APPLY.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF ANY WORK ON THE PROJECT.
3. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY THE OWNER AND THE TOWN OF ANY PROBLEMS IN CONFORMING TO THE APPROVED PLANS FOR ANY ELEMENT OF THE PROPOSED IMPROVEMENTS PRIOR TO ITS CONSTRUCTION.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR DURING CONSTRUCTION ACTIVITIES TO RESOLVE CONSTRUCTION PROBLEMS DUE TO CHANGED CONDITIONS OR DESIGN ERRORS ENCOUNTERED BY THE CONTRACTOR DURING THE PROGRESS OF ANY PORTION OF THE PROJECT. IF, IN THE OPINION OF THE OWNER, THE MODIFICATIONS PROPOSED BY THE CONTRACTOR TO THE APPROVED PLANS INVOLVE SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK, OR TO THE FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESUBMITTING THE REVISED PLAN TO THE OWNER FOR APPROVAL PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE PROJECT. ANY IMPROVEMENTS NOT CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS, OR THE APPROVED REVISED PLANS, SHALL BE REMOVED AND RECONSTRUCTED ACCORDING TO THE APPROVED PLANS.
5. THE GRADING PLAN IS FOR ROUGH GRADING ONLY. CHANGES MAY BE NECESSARY TO BRING PLANS INTO CONFORMANCE WITH APPROVED FINAL DRAINAGE PLAN AND SITE PLAN.
6. A WATER TRUCK, IF CALLED BY THE INSPECTOR, WILL BE PROVIDED, BY THE CONTRACTOR, TO MAINTAIN DUST CONTROL.
7. ANY SETTLEMENT OR SOIL ACCUMULATION, BEYOND THE PROPERTY LIMITS, DUE TO GRADING OR EROSION, SHALL BE REPAIRED BY THE CONTRACTOR IMMEDIATELY.
8. NO GRADING SHALL TAKE PLACE IN DELINEATED FLOOD HAZARD AREAS UNTIL THE FINAL DRAINAGE PLAN HAS BEEN APPROVED AND ALL APPROPRIATE PERMITS HAVE BEEN OBTAINED.
9. ANY CONSTRUCTION DEBRIS OR MUD TRACKING ONTO THE PUBLIC RIGHT-OF-WAY, RESULTING FROM THE PROJECT, SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY FIX ANY EXCAVATION OR EXCESSIVE PAVEMENT FAILURE CAUSED BY PROJECT, AND SHALL PROPERLY BARRICADE THE SITE UNTIL CONSTRUCTION IS COMPLETE. FAILURE BY THE CONTRACTOR TO CORRECT ANY OF THE ABOVE WITHIN 48 HOURS OF WRITTEN NOTICE, BY THE TOWN, SHALL CAUSE THE TOWN TO ISSUE A STOP WORK ORDER (RED TAG) AND/OR DO THE WORK AND MAKE A CLAIM AGAINST THE PROJECT'S LETTER OF CREDIT FOR ANY COSTS INCURRED BY THE TOWN.
10. THE CONTRACTOR SHALL BE SOLELY, AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS AT, AND ADJACENT TO, THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, DURING THE PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY, AND SHALL NOT BE LIMITED TO, NORMAL WORKING HOURS. THE DUTY OF THE TOWN TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
12. ~~ALL UTILITY POLES SHALL BE RELOCATED PRIOR TO PLACEMENT OF ANY CONCRETE BY THE ____________ ELECTRIC DEPARTMENT. ALL FACILITIES THAT NEED RELOCATION BY THE ELECTRIC DEPARTMENT WILL BE BILLED TO THE DEVELOPER.~~
13. THE CONTRACTOR SHALL NOTIFY ALL UTILITY OWNERS PRIOR TO ADJUSTING ALL CLEANOUTS, MANHOLES, VALVE BOXES, SURVEY MONUMENTS, AND ANY OTHER FIXTURES TO FINISHED GRADE PRIOR TO FINAL PAVING.
14. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGPERSONS, OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY, IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
15. THE CONTRACTOR SHALL PROVIDE INGRESS AND EGRESS TO PRIVATE PROPERTY ADJACENT TO THE PROJECT THROUGHOUT THE PERIOD OF CONSTRUCTION. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL OBTAIN A WRITTEN AGREEMENT FROM THE PROPERTY OWNERS IMPACTED BY THIS ACCESS. ~~UPON REQUEST, THE CONTRACTOR SHALL PROVIDE A COPY OF THESE WRITTEN AGREEMENTS TO THE OWNER.~~
16. ~~PRIOR TO FINAL PLACEMENT OF SURFACE PAVEMENT, ALL UNDERGROUND UTILITY MAINS SHALL BE INSTALLED AND SERVICE CONNECTIONS STUBBED OUT BEYOND CURB LINE, WHEN ALLOWED BY THE UTILITY. SERVICE FROM PUBLIC UTILITIES AND FROM SANITARY SEWERS SHALL BE MADE AVAILABLE FOR EACH LOT IN SUCH A MANNER THAT WILL NOT BE NECESSARY TO DISTURB THE STREET PAVEMENT, CURB, GUTTER, AND SIDEWALK WHEN CONNECTIONS ARE MADE.~~
17. REPRODUCIBLE COPIES OF "AS BUILT" PLANS SHALL BE SUBMITTED TO THE TOWN PRIOR TO CONSTRUCTION ACCEPTANCE OF THE PUBLIC IMPROVEMENTS (IF ANY PUBLIC IMPROVEMENTS ARE NECESSARY).
18. THE CONTRACTOR SHALL NOTIFY THE COUNTY INSPECTOR AT LEAST 24 HOURS PRIOR TO DESIRED INSPECTION.
19. THE CONTRACTOR SHALL BE RESPONSIBLE TO APPROPRIATELY MARK (BY BAGGING) ALL FIRE HYDRANTS THAT ARE TAKEN OUT OF SERVICE DURING THIS PROJECT. THE CONTRACTOR SHALL NOTIFY THE DISTRICT FIRE DEPARTMENT AT LEAST 24 HOURS PRIOR TO REMOVING ANY FIRE HYDRANT FROM SERVICE.
20. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH WELD COUNTY AT LEAST 24 HOURS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.
21. THE CONTRACTOR SHALL HAVE ONE (1) SIGNED COPY OF THE APPROVED PLANS, ONE (1) COPY OF THE APPROPRIATE STANDARDS AND SPECIFICATIONS. AND A COPY OF ANY PERMITS AND EXTENSION AGREEMENTS NEEDED FOR THE JOB, ON-SITE AT ALL TIMES.
22. THERE SHALL BE NO SITE CONSTRUCTION ACTIVITIES ON SATURDAYS, UNLESS SPECIFICALLY APPROVED BY THE TOWN PUBLIC WORKS INSPECTOR, AND NO SITE CONSTRUCTION ACTIVITIES ON SUNDAYS OR HOLIDAYS, UNLESS THERE IS PRIOR WRITTEN APPROVAL BY THE PUBLIC WORKS DIRECTOR.

WESTERN ENGINEERING CONSULTANTS GENERAL CONSTRUCTION NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF MONUMENT DESIGN & CONSTRUCTION SPECIFICATIONS. IN THE CASE SUCH STANDARDS ARE NOT PROVIDED, A PROPER SPECIFICATION SHALL BE FOLLOWED AS AGREED BETWEEN THE OWNER, ENGINEER, AND CONTRACTOR.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE ELEVATION AND O.D. OF ALL EXISTING LINES AT THE POINT OF CONNECTION TO THE NEW SYSTEM PRIOR TO ORDERING MATERIALS THAT DEPEND ON THIS INFORMATION.
3. WESTERN ENGINEERING CONSULTANTS, INC. LLC (WEC) IS NOT A GUARANTOR OF THE CONSTRUCTING CONTRACTORS OBLIGATION AND PERFORMANCE OF WORK.
4. WEC IS NOT RESPONSIBLE FOR SAFETY, IN, ON, OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS THERETO.
5. WEC EXERCISES NO CONTROL OF THE SAFETY OR ADEQUACY OF ANY EQUIPMENT, BUILDING COMPONENTS, SCAFFOLDING, FORMS, OR OTHER WORK AIDS USED IN OR ABOUT THE PROJECT, OR IN THE SUPERVISION OF THE SAME.

ARCHITECTURAL INFORMATION:

1. THESE PLANS USED THE BUILDING PLANS PREPARED BY CLEARY BUILDING CORP, DATED 07/29/20, APPROVED BY THE TOWN OF MONUMENT IN 2020.
2. ANY SUBSEQUENT REVISIONS MADE BY CLEARY BUILDING CORP. ARE NOT REFLECTED IN THIS PLAN SET. REVISIONS DESCRIBED AND DATED ON INDIVIDUAL SHEETS IN THIS PLAN SET ARE ENGINEERING REVISIONS ONLY.

UTILITY LOCATION NOTES:

1. COLORADO STATE S.B. 93-155 REQUIRES ANYONE WHO ENGAGES IN ANY TYPE OF EXCAVATION TO PROVIDE ADVANCE NOTICE OF AT LEAST TWO (2) BUSINESS DAYS NOT INCLUDING THE DAY OF ACTUAL NOTICE.

UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) 811 or 1-800-922-1987

2. NEW UTILITIES MAY HAVE BEEN INSTALLED SINCE THE LOCATES FOR THIS PROJECT WERE COMPLETED (IE NOT SHOWN ON PLANS). IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ATTAIN NEW LOCATES AS STATED BY LAW.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND COORDINATE ADDITIONAL LOCATES IF THE STATE OR ANOTHER UTILITY ENTITY HAS UTILITIES IN THE AREA WHICH WERE NOT IDENTIFIED BY UNCC.

UTILITY POTHOLE & SURVEY NOTES:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO STARTING CONSTRUCTION. LOCATIONS WHERE EXISTING UTILITIES AND PROPOSED CONSTRUCTION CROSS OR POTENTIALLY CONFLICT SHALL BE POTHOLED BY THE CONTRACTOR, ELEVATIONS SURVEYED, AND RESULTS AND CONFLICTS PROVIDED TO WEC. WEC REQUIRES A MINIMUM OF 5 WORKING DAYS FOR RE-DESIGN OF ANY CONFLICTS DISCOVERED BY THE POTHOLE. SEE ALSO CONTRACTOR'S AS-BUILT DRAWING NOTES.
2. THE CONTRACTOR SHALL PROVIDE DRAWINGS OF EXISTING ON-SITE UNDERGROUND UTILITIES AS EXPLAINED WITHIN THE CONTRACTOR'S AS-BUILT DRAWING NOTES. THE CONTRACTOR IS REQUIRED TO PLAN AHEAD AND NOTIFY THE OWNER OF ANY CONFLICTS IN A TIMELY MANNER.

CONTRACTOR'S AS-BUILT DRAWING NOTES:

1. THE CONTRACTOR SHALL PROVIDE, AT THE COMPLETION OF THE PROJECT OR EACH PHASE OF THE PROJECT, A COMPLETE SET OF "AS-BUILT" DRAWINGS TO THE OWNER. THE AS-BUILT DRAWINGS WILL CONSIST OF A MARKED-UP SET OF "ISSUED FOR CONSTRUCTION" DRAWINGS VERIFYING THE FOLLOWING:
    - A) ALL LENGTHS, SIZES, AND MATERIALS OF INSTALLED PIPE, MANHOLES, AND ANY OTHER IMPROVEMENT.
    - B) HORIZONTAL LOCATIONS EITHER BY STATION AND OFFSET, OR BY NORTHING AND EASTING COORDINATES OF ALL MANHOLES, BENDS, CLEANOUTS, VALVES, TAPS, WYES, STUBS, PLUGS, TEES, ETC.
    - C) INVERT ELEVATION OF EACH CONSTRUCTED PIPE AT: STORM SEWER AND SANITARY SEWER MANHOLES, INLETS, OUTLETS, STUB ENDS, ETC. TOP OF PIPE ELEVATIONS OF EACH FOREIGN PIPE OR UTILITY CROSSING.
    - D) CONSTRUCTED SLOPE OF STORM AND SANITARY PIPES BETWEEN MANHOLES AND STRUCTURES.
    - E) TOP OF PIPE ELEVATION AT REGULAR INTERVALS AND/OR FITTINGS FOR WATER LINES, FIRE PROTECTION LINES, GAS LINES, AND ELECTRIC CONDUITS.
    - F) ELEVATIONS AT FLOWLINE OF CURB AND GUTTER AT DESIGN LOCATIONS AND GRADE BREAKS. ELEVATION OF INLET AND TRENCH DRAIN GRATES. TOP OF CURB AT CURB INLETS.
    - G) ANY OTHER VARIATIONS FROM THE CONSTRUCTION DOCUMENTS MUST BE CLEARLY NOTED AND DETAILED ON THE PLANS.
2. THE CONTRACTOR SHALL VERIFY AND SUBMIT, FOR APPROVAL BY THE OWNER, THE GROUND SURFACE ELEVATIONS AT THE FINAL COMPLETION OF THE PROJECT PRIOR TO THE FINAL ACCEPTANCE.
3. THE FINAL AS-BUILT DRAWING CERTIFICATE SHALL BE SIGNED ON EACH SHEET BY THE CONTRACTOR RESPONSIBLE FOR THE WORK.
4. CONTRACTOR AS-BUILT DRAWINGS WILL BE DUE PRIOR TO SUBMITTING THE FINAL PAY REQUEST. NON-CONFORMING AS-BUILT DRAWINGS WILL BE RETURNED TO THE CONTRACTOR FOR REVISIONS AND RESUBMITTAL. FINAL PAYMENT WILL NOT BE APPROVED UNTIL THE OWNER HAS REVIEWED AND APPROVED THE AS-BUILT DRAWINGS.
5. ALL AS-BUILT SURVEYING SHALL MEET COLORADO STANDARD OF CARE. (I.E. HORIZONTAL WITHIN 0.10-FEET AND VERTICAL WITHIN 0.05-FEET). IT IS RECOMMENDED ALL GRAVITY SYSTEMS BE DIFFERENTIAL SURVEYED TO MAINTAIN ACCEPTABLE TOLERANCES.

GEOTECHNICAL NOTES:

1. FOR ALL GEOTECHNICAL RELATED ISSUES (PIPE BEDDING, BACKFILL, IMPORTING FILLS, ASPHALT, ETC), SEE PROJECT GEOTECHNICAL REPORT TITLED "SOILS REPORT FOR ABC LANDSCAPING" - GEOQUEST, LLC, DATED MAY 18, 2020. SEE ALSO THE COUNTY DESIGN & CONSTRUCTION STANDARDS & SPECIFICATIONS - IF NONE AVAILABLE CDOT STANDARDS SHALL BE USED.

GEOTECHNICAL TESTING:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL TESTING IN ORDER TO MEET TOWN, FIRE DISTRICT, AND PROPERTY OWNER REQUIREMENTS AND DESIGN STANDARDS.
2. THE OWNER SHALL PAY FOR TESTING TO MEET THE MINIMUM REQUIRED BY TOWN STANDARDS.
3. ALL COSTS FOR FAILING TESTS WILL BE DEDUCTED FROM THE CONTRACTOR'S PAYMENT REQUEST(S).

CONSTRUCTION WORK LIMITS:

1. NO CONSTRUCTION ACTIVITIES SHALL TAKE PLACE OUTSIDE OF THE SHOWN WORK LIMITS, EXCEPT FOR ACCESS WITHIN EXISTING ACCESS ROUTES.
2. ALL EXISTING FENCE WITHIN THE CONSTRUCTION WORK LIMITS SHALL BE REMOVED, SALVAGED, AND REPLACED AS DIRECTED BY THE OWNER.
3. ANY FENCE DAMAGED DURING REMOVAL SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

BASIS OF BEARING & BENCHMARK:

BASIS FOR BEARINGS: HORIZONTAL COORDINATES ARE BASED UPON THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE.

PROJECT BENCHMARK: ELEVATIONS ARE BASED UPON NGS POINT T395 - A STEEL ROD IN A MONUMENT BOX - WITH AN ELEVATION OF 7111.32.

SURVEY CONSTRUCTION NOTES:

1. PROJECT HORIZONTAL & VERTICAL CONTROL AND CONTROL NOTES ARE SHOWN ON THE HORIZONTAL BASELINE CONTROL SHEET OF THIS PLAN SET.
2. ALL PROPERTY PINS OR SURVEY MONUMENTS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED BY A LICENSED SURVEYOR AT THE CONTRACTOR'S EXPENSE. THIS SHALL INCLUDE A SURVEY PLAT IF REQUIRED BY LAW.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIND AND IDENTIFY ALL EXISTING SURVEY MONUMENTS WHICH MAY BE DISTURBED DURING CONSTRUCTION.
4. EXISTING HORIZONTAL AND VERTICAL CONTROL SHALL BE VERIFIED BY A PROFESSIONAL LAND SURVEYOR. THE CONTRACTOR'S SURVEYOR SHALL PROVIDE WRITTEN CONFIRMATION VERIFYING THE CONTROL IS SATISFACTORY PRIOR TO BEGINNING OF CONSTRUCTION.
5. ALL CONSTRUCTION SURVEYING SHALL MEET COLORADO STANDARD OF CARE.
6. THE CONTRACTOR SHALL FIELD SURVEY THE EXISTING GROUND SURFACE ALONG THE PROPOSED ALIGNMENT, COMPARE THE SURFACE TO THE TOPOGRAPHY AS SHOWN ON THESE PLANS AND SUBMIT IN WRITING ANY CONCLUSIONS / DISCREPANCIES BETWEEN THE SURVEYS.
7. ALL FIELD STAKING SHALL BE PERFORMED AND LABELED MATCHING THE STATIONING AND OFFSET BASELINE AS SHOWN IN THIS PLAN SET. ARBITRARY BASELINE OR STATIONING (NOT MATCHING THESE DESIGN PLANS) WILL NOT BE ALLOWED.
8. CUT-SHEETS ARE REQUIRED TO BE COPIED TO THE SPECIFIC IMPROVEMENT CONTRACTOR, OWNER AND WEC WITHIN 2 DAYS OF CONSTRUCTION STAKING.
9. ANY MONUMENTS INSTALLED FOR THIS PROJECT (NEW & REVISED) SHALL BE PER CDOT DETAIL (M-629-1).

EXISTING TOPOGRAPHY and CONTOURS:

1. ALL PROFILES (THIS PLAN SET) REPRESENT A DIGITAL TERRAIN MODEL (DTM) CREATED BY WEC BASED ON AERIAL DRONE SURVEY BY WEC (CONTROL PROVIDED BY BAILEY PROFESSIONAL SOLUTIONS).
2. CONTOUR LINES OF EXISTING/ORIGINAL GRADE HAVE A 2-FOOT INTERVAL ACCURACY AND ARE SHOWN FOR ILLUSTRATION ONLY.

GRADING and COMPACTION NOTES:

REFERENCE THE GEOTECHNICAL REPORT "SOILS REPORT FOR ABC LANDSCAPING" - BY GEOQUEST, LLC, DATED MAY 18, 2020

1. ALL EXCESS SOIL MATERIALS ARE TO BE STOCKPILED AS DIRECTED BY THE TOWN OR REMOVED AT THE CONTRACTOR'S EXPENSE. ALL CONCRETE, ASPHALT, AND OTHER REMOVED IMPROVEMENTS SHALL BE DISPOSED OF AT THE CONTRACTOR'S EXPENSE.
2. ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL CONDITION AS A MINIMUM, UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL GRADEWORK TO ENSURE POSITIVE DRAINAGE AT ALL TIMES (MATCH ORIGINAL CONDITIONS).
4. ALL BACKFILL SHALL MEET THE TYPICAL TRENCH DETAIL SPECIFICATIONS SHOWN IN THIS PLAN SET, AND PER TOWN CRITERIA.
5. ALL OTHER SOIL PLACEMENT OVER 12-INCHES IN THICKNESS SHALL ALSO MEET THE TYPICAL TRENCH DETAIL COMPACTION SPECIFICATIONS SHOWN IN THIS PLAN SET.
6. STRIP THE TOP 6-INCHES OF ALL AREAS TO BE DISTURBED DURING CONSTRUCTION, AND STOCKPILE SEPARATE FROM TRENCH SPOILS IN LOCATION(S) AS APPROVED BY PROPERTY OWNER AND TOWN. REPLACE STRIPPINGS ABOVE COMPLETED PIPELINE MATCHING PRE-CONSTRUCTION GRADES.
7. THE CONTRACTOR SHALL MEET THE PROJECT SPECIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT AND COORDINATE SCHEDULING THE GEOTECHNICAL TESTING FIRM IN ORDER TO MEET THE PROJECT SPECIFICATIONS AND STANDARDS.
8. FOR GRADING NOT SHOWN HERE-IN THESE PLANS, REFER TO LANDSCAPE GRADING BY OTHERS. LANDSCAPE FINAL GRADING TO BE PROVIDED BY OTHERS.
9. ROUGH GRADING VERTICAL TOLERANCES ARE ± 0.10 FT.
10. COMPACTION OF ALL HYDRANT RUN BACKFILL SHALL MEET 100% OF MAXIMUM DENSITY AND WITHIN 3% +/- OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY STANDARD PROCTOR ASTM-D-698.
11. CONTRACTOR TO PROVIDE TRAFFIC CONTROL MEASURES AS REQUIRED BY TOWN STANDARDS FOR PUBLIC RIGHT OF WAY.
12. IF NECESSARY TO ACCESS OVER EXISTING IMPROVEMENTS (IE, EXISTING ROADS, SHALLOWS, UTILITIES ETC,.) THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL CONSULTANT REGARDING PROTECTION AGAINST CONSTRUCTION TRAFFIC LOADS.

EROSION CONTROL & STORM WATER MANAGEMENT PLAN:

1. ALL EROSION CONTROL MEASURES MUST BE INSTALLED PER URBAN DRAINAGE FLOOD CONTROL DISTRICT (UDFCD) REQUIREMENTS (UNLESS OTHERWISE SHOWN HEREIN), AND ALSO STATE SWMP PERMIT REQUIREMENTS.
2. ALL DISTURBED AREAS (I.E. CONSTRUCTION WORK LIMITS) SHALL BE ENCLOSED BY SILT FENCE IF POTENTIAL FOR RUNOFF EXISTS.
3. INSTALL VEHICLE TRACKING CONTROL AT ALL ACCESS ROAD LOCATIONS ADJACENT TO ALL ENTRANCES / EXITS TO & FROM THE SITE.
4. SEE EROSION PROTECTION DETAILS.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN (IE, SEASONAL SEEDING, MATERIALS, ETC.) ANY AND ALL EROSION PROTECTION NECESSARY UNTIL FINAL ACCEPTANCE OR ONCE SEEDING IS ESTABLISHED, WHICHEVER COMES FIRST.
6. THE CONTRACTOR SHALL PROVIDE SWEEPING AS NECESSARY TO KEEP PRIVATE AND PUBLIC ROADWAYS CLEAN OF DEBRIS.

SEEDING:

1. ALL SEEDING SHALL BE PER TOWN PARKS & RECREATION DESIGN STANDARDS AND AS ACCEPTABLE TO THE PROPERTY OWNER.

ADJACENT DITCH or LATERAL WORK:

1. NO WORK SHALL COMMENCE WITHIN 15-FEET OF ANY DITCH OR LATERAL TOP OF BANK EXCEPT AT THOSE CROSSING LOCATIONS AS NOTED ON THE PLANS UNLESS OTHERWISE APPROVED BY THE OWNER AND APPROPRIATE DITCH COMPANY.
2. ALL WORK WITHIN 15-FEET OF ANY DITCH OR LATERAL TOP OF BANK SHALL MEET ALL REQUIREMENTS AND SPECIFICATIONS PER THE DITCH CROSSING PERMIT.
3. CONTACT OWNER/WEC FOR ANY DITCH RELATED ISSUES.

ELECTRIC and COMMUNICATION CONDUIT CONSTRUCTION NOTES:

1. SEE ALSO ELECTRICAL PLANS FOR ELECTRIC AND COMMUNICATION DESIGN AND SPECIFICATIONS - BY OTHERS.

RELOCATION OF EXISTING LIGHT POLES and EQUIPMENT:

1. ~~SEE ALSO ELECTRICAL PLANS FOR REMOVAL, SALVAGE, AND RE-INSTALLATION OF EXISTING LIGHT POLES AND EXISTING SECURITY IMPROVEMENTS - BY OTHERS.~~

RAW WATERLINE CONSTRUCTION NOTES:

1. ~~RAW WATERLINE PIPE SHALL BE RIGID POLYVINYL CHLORIDE (PVC) ASTM D3034 (< 15") OR ASTM 679 (≥ 15") WITH WALL THICKNESS SDR 35, ADS N-12 SMOOTH INTERIOR, OR AS APPROVED BY THE ENGINEER.~~
2. ~~ALL LENGTHS SHOWN ON THE PLANS ARE FROM END TO END OR PI TO PI.~~
3. ~~THE CONTRACTOR SHALL INSTALL TEMPORARY PLUGS (IF NECESSARY) AT EXISTING HEAD GATES AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION ACCEPTANCE IS ISSUED, AT WHICH TIME THEY SHALL BE REMOVED BY THE CONTRACTOR.~~
4. ~~INSTALL MARKER POSTS IN NON-FARMABLE AREAS OR PERMANENT SURVEY MONUMENTS IN EXISTING CONCRETE STRUCTURES WITHIN 2.0-FEET OF PIPELINE BEND LOCATIONS (ALONG THE PIPE CENTERLINE NOT OFFSET).~~
5. ~~RAW WATERLINE PIPE SHALL BE AIR TESTED AT 4 PSIG OR AS APPROVED BY THE ENGINEER (SHALL DEPEND UPON PIPE MATERIAL USED).~~

STORM SEWER CONSTRUCTION NOTES:

1. ALL STORM SEWER PIPE TO BE A.S.T.M. C-76, CLASS III REINFORCED CONCRETE PIPE WITH RUBBER GASKETS MEETING AASHTO M-170 REQUIREMENTS. UNLESS OTHERWISE NOTED.
2. STORM SEWER MANHOLES SHALL BE 4 FEET DIAMETER FOR 30 INCH PIPE OR LESS, 5 FEET DIAMETER FOR 36 INCH PIPE. FOR SIZES ABOVE 36 INCH, CONCRETE JUNCTION BOXES, OR PRECAST MANHOLE TEES, WILL BE DETAILED BY THE ENGINEER.
3. ALL ROADWAY STORM SEWER INLETS ARE CDOT TYPE R CURB INLETS, UNLESS OTHERWISE NOTED. THE PROPOSED POND STORM SEWER OUTLET IS CDOT TYPE C.
4. ALL STORM SEWER MANHOLE AND INLET LIDS SHALL BE LABELED PER TOWN STANDARDS INCLUDING THE FOLLOWING CONFINED SPACE INFORMATION "STORM SEWER, CAUTION CONFINED SPACE, ENTRY PERMIT REQUIRED," (TO BE COORDINATED WITH TOWN INSPECTOR).
5. MANHOLE AND INLET LID LOCATION TO BE COORDINATED WITH TOWN INSPECTOR.
6. A MINIMUM OF 2.0 FEET OF COVER OVER THE TOP OF THE STORM SEWER LINES SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.
7. A MINIMUM VERTICAL SEPARATION OF 18" SHALL BE MAINTAINED AT ALL CROSSINGS UNLESS OTHERWISE NOTED.
8. ALL LENGTHS OF STORM SEWER LINES SHOWN ON THE PLANS ARE MEASURED HORIZONTALLY FROM CENTER TO CENTER OF ALL STRUCTURES, MANHOLES, BENDS, TEES, AND INLETS UNLESS OTHERWISE NOTED.
9. STORM SEWER SHALL BE AIR TESTED AT 4 PSIG. CONCRETE MANHOLES SHALL BE TESTED PER MANHOLE LEAKAGE TEST.
10. ALL STORM SEWER PIPE SHALL BE LEFT SMOOTH, CLEAN, AND FREE OF OBSTRUCTIONS THROUGHOUT THE ENTIRE ALIGNMENT.
11. PIPE, BENDS, TEES, AND ALL ACCESSORIES ARE TO BE SUPPLIED BY THE SAME SUPPLIER.
12. EXCAVATION SHALL BE DEWATERED AS NECESSARY TO EXCAVATE AND PLACE PIPE WITHIN DRY TRENCH.
13. ALL INSTALLED STORM PIPING IS REQUIRED TO BE WATER JETTED CLEAN TWO WEEKS PRIOR TO THE FINAL ACCEPTANCE WALK THRU.
14. ALL STORM PIPING THIS PROJECT "PRIVATE" UNLESS OTHERWISE NOTED.

STORM DRAINAGE MAINTENANCE:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM EROSION AND SEDIMENT CONTROL MEASURES (INCLUDING PLANTINGS) AND TO MAINTAIN CONSTRUCTED DRAINAGE FACILITIES THROUGH THE CONSTRUCTION PROCESS IN A MANNER THAT PRESERVES THE INTENDED FUNCTION AND LIFE OF THE FACILITIES.

SANITARY SEWER CONSTRUCTION NOTES:

1. REFERENCE APPLICABLE WATER AND SANITARY DISTRICT RULES AND REGULATIONS.
2. SEWER PIPE SHALL BE RIGID POLYVINYL CHLORIDE (PVC) ASTM D3034 (< 15") OR ASTM 679 (≥ 15") WITH WALL THICKNESS SDR 35 (SDR 26 FOR DEPTHS ≥ 20').
3. ALL LENGTHS OF SEWER LINE SHOWN ON THE MASTER UTILITY PLAN ARE FROM THE CENTER OF MANHOLE TO THE CENTER OF MANHOLE.
4. THE CONTRACTOR SHALL INSTALL TEMPORARY PLUGS IN THE MANHOLES AT THE POINTS OF CONNECTION TO THE EXISTING SEWER SYSTEMS. PLUGS SHALL REMAIN IN PLACE UNTIL CONSTRUCTION ACCEPTANCE IS ISSUED, AT WHICH TIME THEY SHALL BE REMOVED BY THE CONTRACTOR.
5. INSTALL MARKER POSTS IN LANDSCAPE AREAS OR PERMANENT SURVEY MONUMENTS IN EXISTING PAVED SURFACES WITHIN 2.0-FEET OF EVERY MANHOLE AND STUB LOCATION (ALONG THE PIPE CENTERLINE NOT OFFSET).

STREET CONSTRUCTION NOTES:

1. ALL STREET IMPROVEMENTS TO BE COMPLETED PER TOWN DESIGN & CONSTRUCTION STANDARDS.
2. HANDICAP RAMPS ARE TO BE FORMED AT ALL INTERSECTIONS.

ASPHALT NOTES:

1. ASPHALT PATCHBACK SECTION ASSUMED TO BE FULL DEPTH - 9.0 INCHES THICK ON 8-INCHES OF COMPACTED SUBGRADE PER TOWN STANDARDS. OWNER TO PROVIDE GEOTECHNICAL REPORT OR CONSTRUCT PER COUNTY DESIGNATED THICKNESS. SEE GEOTECHNICAL NOTES AND TYPICAL ASPHALT AND CONCRETE TRENCH PATCH DETAILS.
2. STANDARD ASPHALT INSTALLATIONS MUST FOLLOW TOWN STANDARDS.

PAVEMENT REMOVAL NOTES:

1. ALL ASPHALT PAVEMENT CUTS SHALL BE IN STRAIGHT LINES. IRREGULAR SHAPED CUTS WITH MORE THAN FOUR (4) SIDES OR CUTS WITHIN EXISTING PATCHES SHALL NOT BE ALLOWED. ALL CUTS SHALL BE RECTANGULAR IN SHAPE, AND EDGES SHALL BE PARALLEL OR PERPENDICULAR TO THE FLOW OF TRAFFIC.
2. IN ORDER TO PROVIDE STRAIGHT EDGES, ALL ASPHALT PAVEMENT CUTS SHALL BE CUT BY SAW CUTTING, ROTOMILLING, OR ANOTHER APPROVED METHOD WHICH ASSURES A STRAIGHT EDGE FOR THE REQUIRE DEPTH OF THE CUT.
3. ASPHALT PAVEMENT CUTS SHALL BE SUCH THAT NO LONGITUDINAL JOINT LIES WITHIN THE WHEEL TRACK.
4. CONCRETE PAVEMENT SHALL BE REMOVED AND REPLACED FROM EXISTING PANEL JOINTS ONLY.

FIRELINE and WATERLINE CONSTRUCTION NOTES:

1. REFERENCE APPLICABLE WATER AND SANITARY DISTRICT RULES AND REGULATIONS.
2. A MINIMUM OF 4.5 FEET OF COVER OVER THE TOP OF THE WATER LINES IS TO BE MAINTAINED. (5'-0" MINIMUM OF COVER FOR FIRE PROTECTION LINES.)
3. A MINIMUM VERTICAL SEPARATION OF 18" SHALL BE MAINTAINED AT ALL CROSSINGS, UNLESS OTHERWISE NOTED.
4. ALL LENGTHS OF WATER LINE AND FIRE PROTECTION LINES SHOWN ON THE PLANS ARE MEASURED HORIZONTALLY FROM CENTER TO CENTER OF ALL VALVES, FITTINGS, BENDS, TEES, ETC. VERTICAL RISERS ARE MEASURED VERTICALLY.
5. P.V.C. FIRE PROTECTION LINES TO BE AWWA C-900, CLASS 200. D.I.P. FIRE PROTECTION LINES AND FITTINGS TO BE PRESSURE CLASS 350 AND COMPLY WITH AWWA C-110. ALL PIPELINE APPURTENANCES SHALL BE OF SIMILAR METALS (NO DISSIMILAR METALS).
6. TAPPING SADDLES TO BE USED ONLY FOR TEMPORARY BLOW OFFS.
    - A) ALL TEMPORARY BLOW OFF TAPPING SADDLES SHALL BE BRASS.
    - B) ALL TEES SHALL BE SWIVEL TEES.
7. FIRE PROTECTION AND WATER LINES SHALL BE HYDROSTATICALLY TESTED AT 150 PSI FOR 2 HOURS.
8. ALL WATER LINES, INCLUDING FIRE LINES, ARE TO BE DISINFECTED AND PRESSURE TESTED PER DISTRICT STANDARDS.
9. TEMPORARY TAP(S) SHALL BE INSTALLED AS REQUIRED TO FLUSH AND TEST THE LINE. THE TAPPING SADDLE SHALL BE PLUGGED WITH A BRASS PLUG UPON COMPLETION.
10. THE DISTRICT WATER DEPARTMENT INSPECTOR SHALL BE NOTIFIED PRIOR TO BACK- FILLING AND TESTING (DISINFECTION AND HYDROSTATIC).
11. PIPE, FITTINGS, BOLTS, WASHERS, NUTS AND ALL ACCESSORIES ARE TO BE SUPPLIED BY THE SAME MANUFACTURER.
12. EXCAVATION SHALL BE DEWATERED AS NECESSARY TO EXCAVATE AND PLACE PIPE WITHIN DRY TRENCH.
13. ~~CLAY CUT-OFF WALLS SHALL BE INSTALLED WITHIN 10-FEET OF EVERY BRANCH OF A TEE, BEND, CROSS, MANHOLE. OR PHASE ENDING. THE DISTANCE BETWEEN CLAY CUT-OFF WALLS BETWEEN FITTINGS SHALL NOT EXCEED 400 FEET ON ANY LINE.~~
14. INSTALL MARKER POSTS IN LANDSCAPE AREAS OR PERMANENT SURVEY MONUMENT IN EXISTING PAVED SURFACES ABOVE ALL HORIZONTAL BENDS AND STUB LOCATIONS.
15. ALL NEW HYDRANTS SHALL BE MUELLER.

FIRELINE and WATERLINE RESTRAINT NOTES:

1. REFERENCE APPLICABLE WATER AND SANITARY DISTRICT RULES AND REGULATIONS.
2. BOTH THRUST BLOCKS AND MEGALUG RESTRAINTS (ALL JOINTS AND FITTINGS) ARE REQUIRED. NEW PIPING AND FITTINGS SHALL BE CONTINUOUSLY CONNECTED WITH MEGALUGS. ALL THRUST RESTRAINT CONCRETE SHALL BE 28 DAY COMPRESSIVE STRENGTH ≥ 3,500 P.S.I.
3. ALL MECHANICAL JOINTS SHALL BE RESTRAINED USING MEGALUG SERIES 2000 PV (NEW JOINTS) OR 2000 SV (SPLIT VERSION) FOR EXISTING JOINTS (TIE- INTO EXISTING SYSTEM) OR UNI-FLANGE SERIES UFR 1300 C-"DIA" OR APPROVED EQUAL.
4. ALL PUSH-ON JOINTS SHALL BE RESTRAINED USING MEGALUG SERIES 1600 OR UNI-FLANGE SERIES 1390-C-"DIA" OR APPROVED EQUAL.
5. CONNECTION TO AN EXISTING SYSTEM WITH A NEW GATE VALVE SHALL BE RESTRAINED ON EACH SIDE.
6. ANY EXISTING UNRESTRAINED FIRELINE JOINTS/FITTINGS EXPOSED DURING CONSTRUCTION SHALL BE RESTRAINED USING THE APPROPRIATE MEGALUG SERIES.
7. TO INSTALL MEGALUG TO EXISTING MECHANICAL JOINT FITTINGS AND VALVES, REMOVE BOLTS AND SLIDE EXISTING RETAINER GLAND AWAY FROM FITTING. INSTALL MEGALUG SERIES 2000 PER MANUFACTURER'S SPECIFICATIONS. DO NOT ATTEMPT TO REMOVE THE EXISTING FOLLOWER GLAND.
8. EXISTING THRUST BLOCKS THAT ARE DISTURBED DURING THE CONSTRUCTION OF THE NEW FIRE PROTECTION LINE SHALL BE REINSTALLED (USING FORMS IF NECESSARY TO CREATE BLOCKING THAT WILL BEAR ON UNDISTURBED SOIL).

SUPPLEMENTAL SPECIAL CONDITIONS:

1. ALL POINTS OF CONNECTION TO ANY EXISTING PIPE AND ALL EXISTING UTILITY CROSSINGS SHALL BE POTHOLED AND THE LOCATION, ELEVATION, PIPE MATERIAL, PIPE DIAMETER, AND ANY OTHER EXISTING INFORMATION SHALL BE NOTED AND FORWARDED TO WEC PRIOR TO ORDERING MATERIALS WHICH DEPEND ON THIS INFORMATION. ALL POTHOLE LOCATIONS ARE SHOWN ON THE PLANS.
2. FOLLOWING SUCCESSFUL PRESSURE TESTING, ALL NEWLY PLACED PIPE SHALL BE LOCATED USING NEW TRACING WIRE AND SURVEYED BY THE CONTRACTOR AS ADDITIONAL AS-BUILT INFORMATION.
3. WEEKLY PROGRESS MEETINGS WILL BE HELD. PROJECT ENGINEER, CONTRACTOR SUPERINTENDENT (SITE SUPERINTENDENT), SUBCONTRACTORS AND OWNER SHALL ATTEND.
4. ALL ADJACENT PROPERTY OWNER RELATIONS & CORRESPONDENCE MUST BE ROUTED THROUGH AND APPROVED BY THE OWNER.
5. ALL PROPOSED PIPE INSTALLATION SHALL BE WITH FULL LENGTHS OF PIPE. NO SHORT OR CUT PIPE SHALL BE INSTALLED UNLESS OTHERWISE APPROVED AND SHOWN ON THE PLANS (I.E. CLOSURE PIECES, FABRICATED BEND LOCATIONS AND AT MANHOLES).

PERMITS

PERMITS	OBTAINED BY
~~BUILDING PERMIT~~	~~OWNER/SUBCONTRACTOR~~
STATE GROUNDWATER DISCHARGE PERMIT	OWNER/WEC/CONTRACTOR
~~NATIONAL PERMIT~~	~~OWNER~~
MONUMENT GRADING PERMIT	OWNER OR CONTRACTOR
MONUMENT SITE PLAN REVIEW	OWNER OR CONTRACTOR

REQUIRED SUBMITTALS:

1. ALL CATALOG CUT SHEETS FOR ALL IMPROVEMENTS, GRADATIONS, MIX DESIGNS, PROCTOR TESTS, TACK COATS, ETC. ARE REQUIRED SUBMITTALS.
2. ALL PROPOSED IMPROVEMENT MATERIALS. (MATERIAL SPECIFICATIONS AND PRODUCT DATA SHEETS ONLY).

PROJECT CLOSE OUT:

1. IT IS THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR TO PERFORM EROSION CONTROL MEASURES (INCLUDING PLANTINGS) AND TO MAINTAIN CONSTRUCTION FACILITIES THROUGH THE CONSTRUCTION PROCESS IN A MANNER THAT PRESERVES THE INTENDED FUNCTION AND LIFE OF THE FACILITIES.
2. IT IS THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR TO OBTAIN FINAL ACCEPTANCE FROM THE TOWN AFTER WHICH THE 1-YEAR WARRANTY PERIOD REGARDING ANY PUBLIC IMPROVEMENTS AND RELATED CONSTRUCTION WILL BEGIN.

ADA NOTES:

1. ALL HANDICAP PARKING STALLS, RAMPS, AND ROUTES SHALL MEET CURRENT ADA STANDARDS.

STRIPING NOTES:

1. ALL STANDARD PARKING STALL STRIPING DIMENSIONS ARE 9.0 FEET WIDE BY 20.0 FEET LONG UNLESS OTHERWISE NOTED. (SEE SITE PLAN).
2. ALL STRIPING THIS PROJECT TO BE WHITE UNLESS OTHERWISE NOTED.
3. ALL HANDICAP STALLS TO BE SIGNED & STRIPED PER ADA SPECIFICATIONS, USE BLUE & WHITE SYMBOLOGY, VAN DENOTES VAN ACCESSIBLE STALLS, STD DENOTES STANDARD ACCESSIBLE STALLS.
4. STRIPING MATERIAL TO BE EPOXY FOR LONG LINES AND PRE-FORMED THERMO PLASTIC FOR ARROW LEGENDS.
5. ALL STRIPING SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
6. REMOVAL OF EXISTING STRIPING WHICH CONFLICTS WITH THE NEW STRIPING DESIGN WILL BE REQUIRED. PAVEMENT MARKING REMOVAL AND INSTALLATION WILL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR.
7. LAYOUT OF STRIPING IN THE FIELD WILL REQUIRE APPROVAL BY THE TOWN OF MONUMENT PRIOR TO APPLICATION OF FINAL STRIPING.

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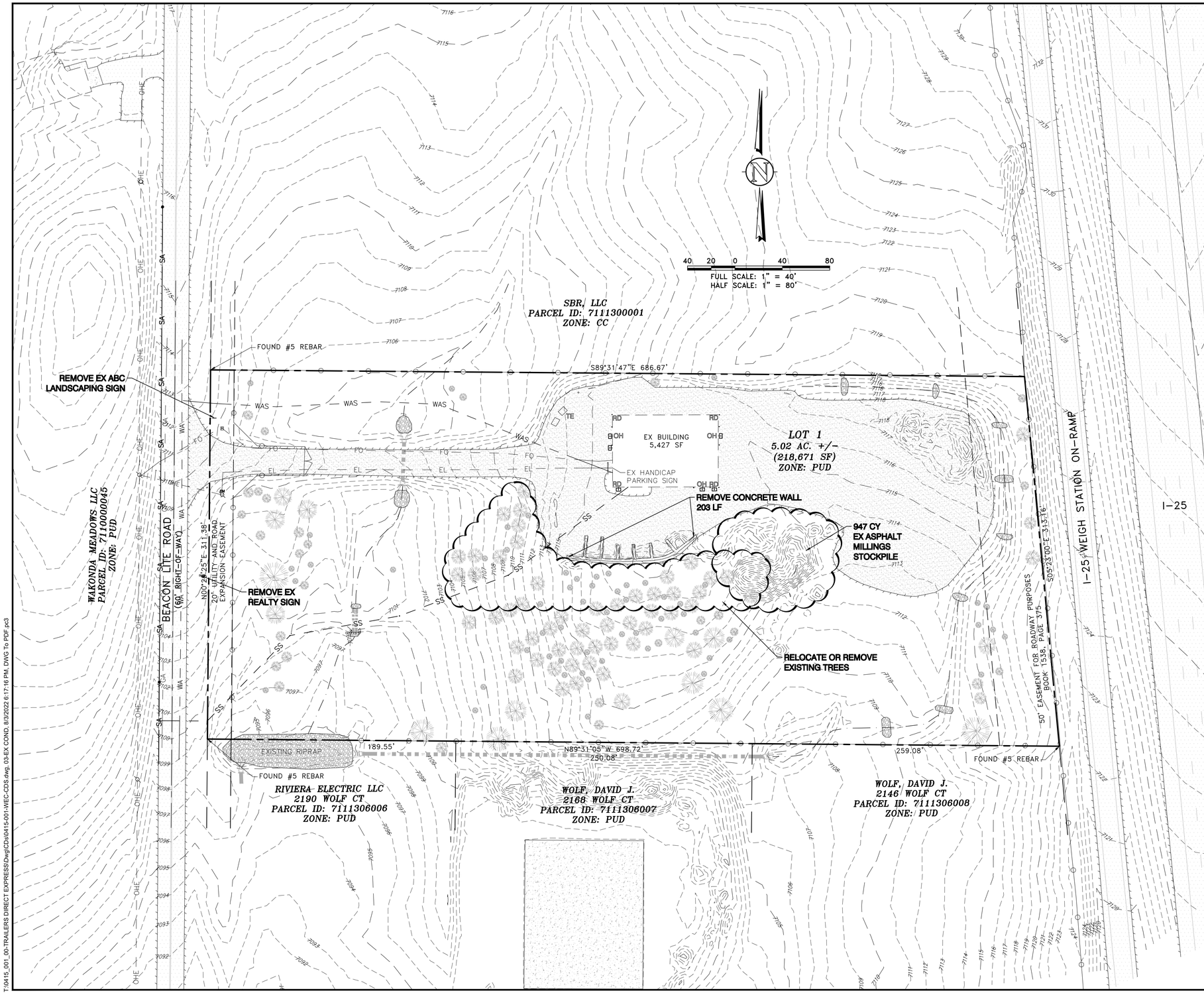
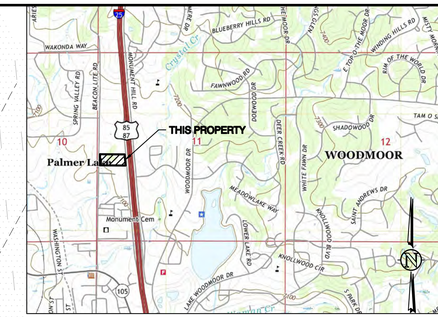
CHECKED BY: CFC
PROJECT NO. 01-0415.001.00
DOC CON # 0002-NOTES
SHEET 2 OF 29





VICINITY MAP SCALE 1" = 2,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM USGS QUAD MAP - MONUMENT 7.5 MIN

NOTES

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SEE COVER SHEET FOR BASIS OF BEARING & BENCHMARK.

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NOT ALL UNCC UTILITY LOCATES HAVE BEEN PERFORMED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES ARE LOCATED AND SURVEY PROVIDED TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION DRAWING RELEASE.

SYMBOL LEGEND

- 45 DEG BEND
- 22.5 DEG BEND
- RESTRAINED PLUG
- RESTRAINED TEE
- WATER METER
- RESTRAINED CROSS
- FIRE HYDRANT
- RESTRAINED VALVE
- UTILITY POLE
- LIGHT POLE/BLDG LIGHT
- EX EVERGREEN TREES
- (15) PROPOSED VISITOR/ EMPLOYEE PARKING
- THRUST BLOCK TB
- GATE VALVE GV
- CURB STOP
- PIPE CROSSING
- MANHOLE
- MANHOLE W/ FLOW DIRECTION
- RD ROOF DRAIN
- EM ELECTRIC METER
- TE TRASH ENCLOSURE
- OH OVERHEAD DOOR
- PROP EVERGREEN TREES
- [32] PROPOSED TRAILER PARKING
- EXISTING MILLINGS
- EXISTING CONC
- EXISTING ASPHALT
- PROPOSED GRAVEL
- PROPOSED CONC
- PROPOSED ASPHALT

LINETYPE LEGEND

- LOT / PROPERTY / SECTION LINE
- RIGHT OF WAY LINE
- EASEMENT
- SETBACK
- EXISTING BUILDING, CURB
- EDGE of ASPHALT or GRAVEL RD
- CHAINLINK FENCE
- SCREENED CHAINLINK FENCE
- WOOD FENCE
- POND WQ W/S
- SWALE
- OHE — EXISTING OVERHEAD ELEC
- EL — EXISTING ELECTRICAL LINE
- ST — EXISTING STORM LINE
- SA — EXISTING SANITARY LINE
- WA — EXISTING WATER LINE
- GA — EXISTING GAS LINE
- FO — EXISTING FIBER OPTIC LINE
- T — EXISTING TELEPHONE LINE
- SA — PROPOSED SANITARY LINE
- SS — PROPOSED SANITARY SERVICE
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SHEET 3 OF 29

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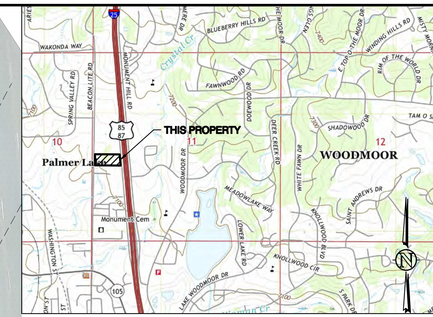

VICINITY MAP SCALE 1" = 2,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM USGS QUAD MAP - MONUMENT 7.5 MIN

NOTES

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- 22.5 DEG BEND
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- RESTRAINED CROSS
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- RESTRAINED VALVE
- UTILITY POLE
- LIGHT POLE/BLDG LIGHT
- EX EVERGREEN TREES
- 15 PROPOSED VISITOR/ EMPLOYEE PARKING
- THRUST BLOCK TB
- GATE VALVE GV
- CURB STOP
- PIPE CROSSING
- MANHOLE
- MANHOLE W/ FLOW DIRECTION
- RD ROOF DRAIN
- EM ELECTRIC METER
- TE TRASH ENCLOSURE
- OH OVERHEAD DOOR
- PROP EVERGREEN TREES
- 32 PROPOSED TRAILER PARKING
- EXISTING MILLINGS
- EXISTING CONC
- EXISTING ASPHALT
- PROPOSED GRAVEL
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PROJECT NO. 01-0415.001.00
DOC CON # 003A-EXCONDAE
SHEET 3A OF 29

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LOT DATA TABLE

	DESCRIPTION	AREA	AREA (ac)	EXISITNG %	PROPOSED %
	LOT	218,859 SF	5.02	100 %	100 %
	EXISTING BUILDINGS	**5,427 SF**	**0.12**		**2.48 %**
	EXISTING CONCRETE	440 SF	0.01	0.20 %	
	EXISTING CONCRETE TO BE REMOVED	440 SF	0.01	0.20 %	
	PROPOSED CONCRETE	2,881 SF	0.07		1.32 %
	TOTAL CONCRETE	**2,881 SF**	**0.07**		**1.32 %**
	EXISTING ASPHALT MILLINGS	50,645 SF	1.16	23.14 %	
	EXISTING MILLINGS TO BE REMOVED	10,246 SF	0.24	4.68 %	
	PROP ASPHALT / ASPHALT MILLINGS	38,042 SF	0.87		17.38 %
(AM)	**TOTAL ASPHALT**	**78,441 SF**	**1.80**		**35.84 %**
	EXISTING LANDSCAPE AREA	162,347 SF	3.73	74.18 %	
	PROPOSED LANDSCAPE AREA	**132,110 SF**	**3.03**		**60.36 %**
	LOT COVERAGE			25.82 %	**39.64 %**

LOT IMPERVIOUSNESS DATA TABLE

	DESCRIPTION	AREA	EXISITNG IMPERVIOUSNESS %	PROPOSED IMPERVIOUSNESS %
	EXISTING BUILDING (90% IMP)	5,427 SF	2.23 %	**2.23 %**
	EXISTING CONCRETE	440 SF	0.20 %	
	EXISTING CONCRETE TO BE REMOVED	440 SF	0.20 %	
	PROPOSED CONCRETE	2,881 SF		1.32 %
	TOTAL CONCRETE (100% IMP)	**2,881 SF**		**1.32 %**
	EXISTING ASPHALT MILLINGS	50,645 SF	23.14 %	
	PROPOSED ASPHALT MILLINGS	27,796 SF		12.70 %
(AM)	**ASPHALT MILLINGS (100% IMP)**	**78,441 SF**		**35.84 %**
	EX LANDSCAPE AREA (2% IMP)	**162,347 SF**	1.48 %	
	PROP LANDSCAPE AREA (2% IMP)	**132,110 SF**		**1.21 %**
	LOT	**218,859 SF**	27.06 %	**40.60 %**

PARKING DATA TABLE

BUILDING	PARKING REQUIREMENT	QTY REQ	QTY PROP
EX OFFICE (475 SF)	1/300 SF	2	
EX WAREHOUSE (4,952 SF)	1.5/EMPLOYEE	8	
REQUIRED ACCESSIBLE STALLS	1/25 SPACES	1	
TOTAL REQUIRED STALLS		**10 (1 HC)**	
PROVIDED SURFACE PARKING STALL			10
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TOTAL PROVIDED STALLS			**10 (1 HC)**
SMALL TRAILER STALL (9'x20')			124
MEDIUM TRAILER STALL (10'x30')			30
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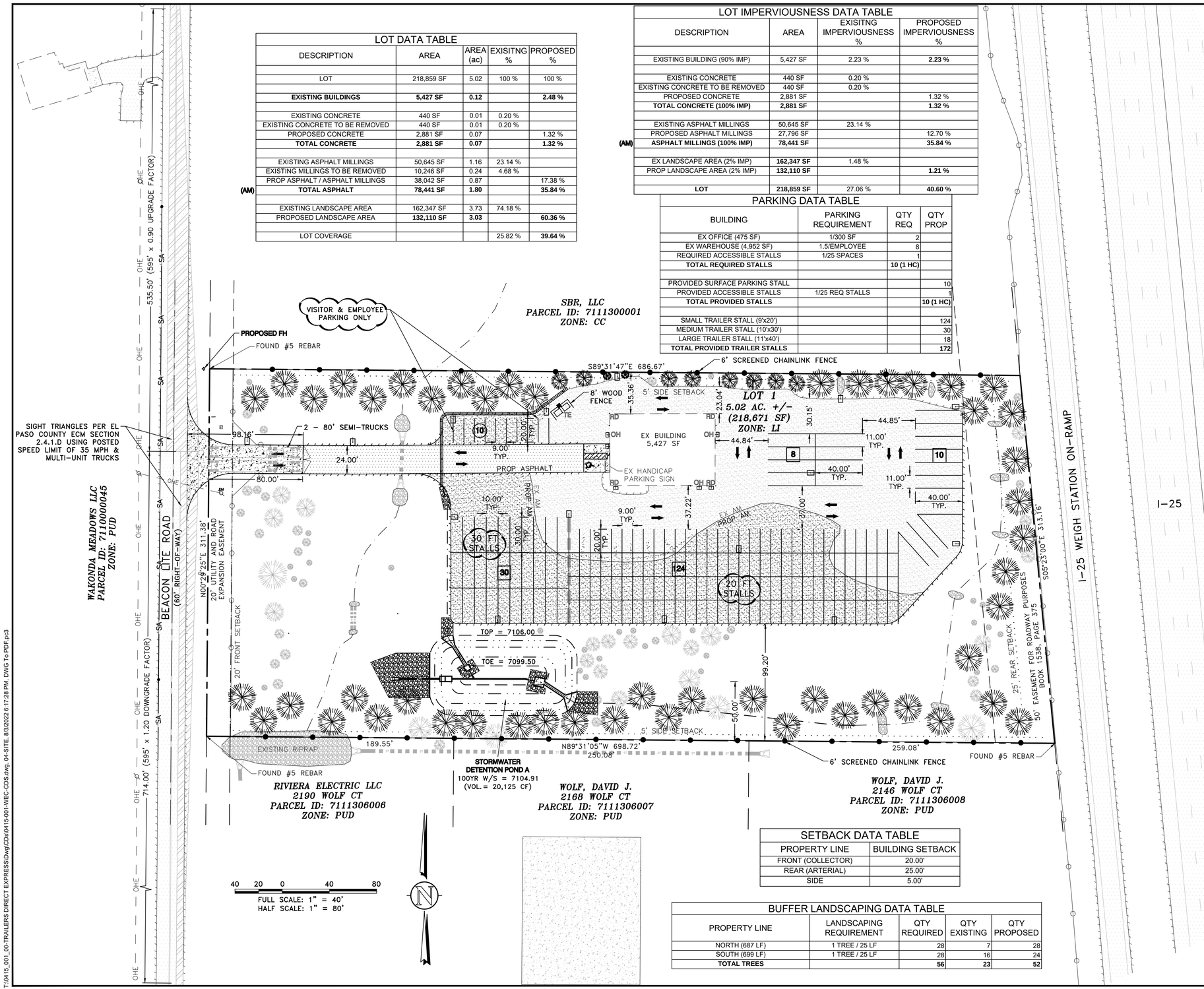
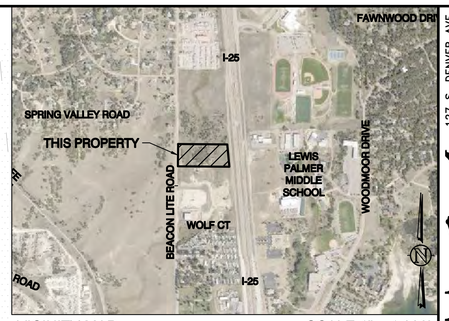


SETBACK DATA TABLE

PROPERTY LINE	BUILDING SETBACK
FRONT (COLLECTOR)	20.00'
REAR (ARTERIAL)	25.00'
SIDE	5.00'

BUFFER LANDSCAPING DATA TABLE

PROPERTY LINE	LANDSCAPING REQUIREMENT	QTY REQUIRED	QTY EXISTING	QTY PROPOSED
NORTH (687 LF)	1 TREE / 25 LF	28	7	28
SOUTH (699 LF)	1 TREE / 25 LF	28	16	24
TOTAL TREES		**56**	**23**	**52**



VICINITY MAP SCALE 1" = 1,000'

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SHOWN VICINITY MAP TAKEN FROM AUTOCAD GEOLOCATION

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PROJECT NO. 01-0415.001.00
DOC CON # 0004-SITE
SHEET 4 OF 29

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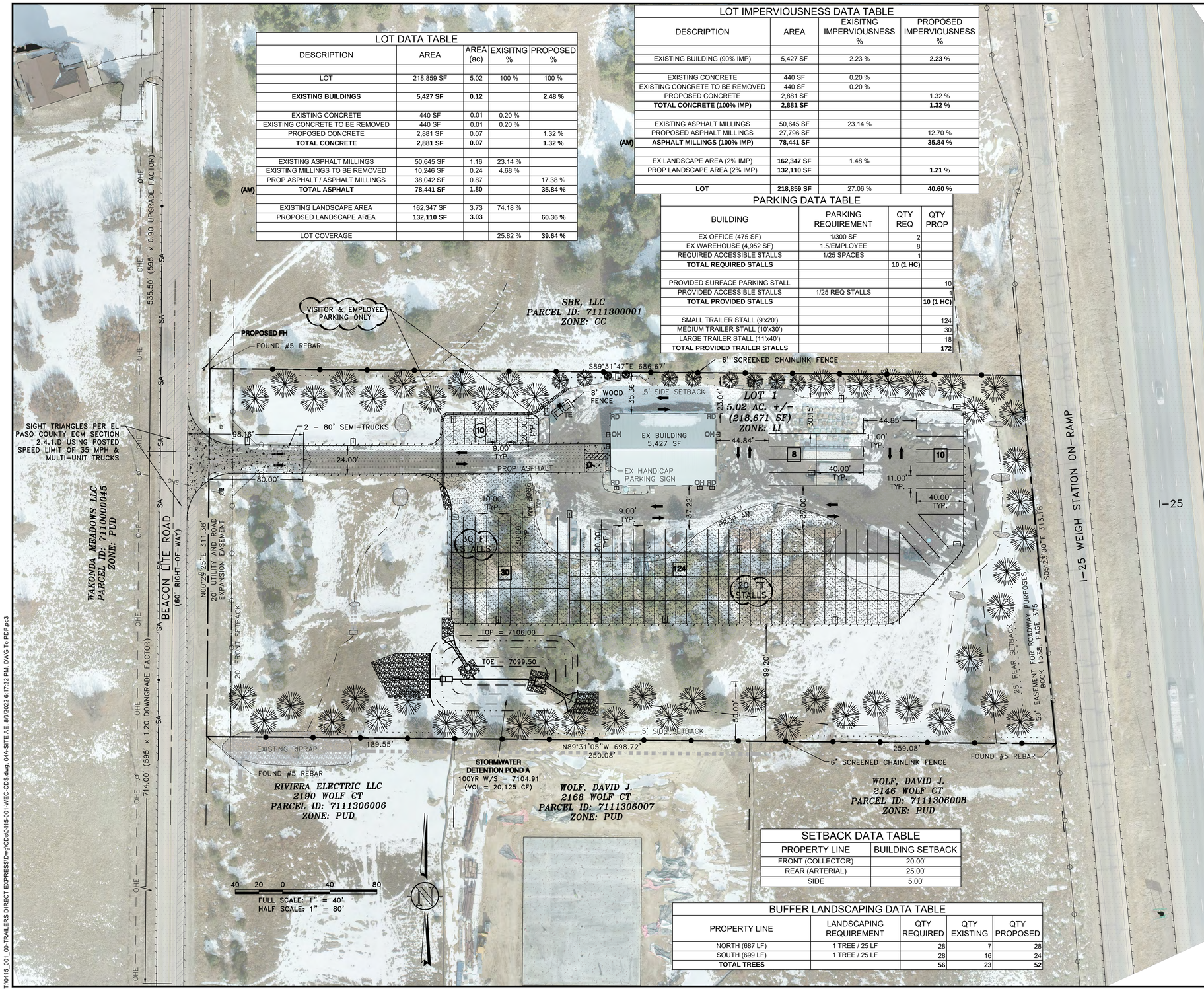

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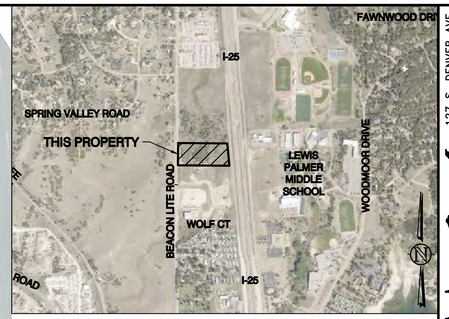

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DOC CON # 004A-SITE AE
SHEET 4A OF 29

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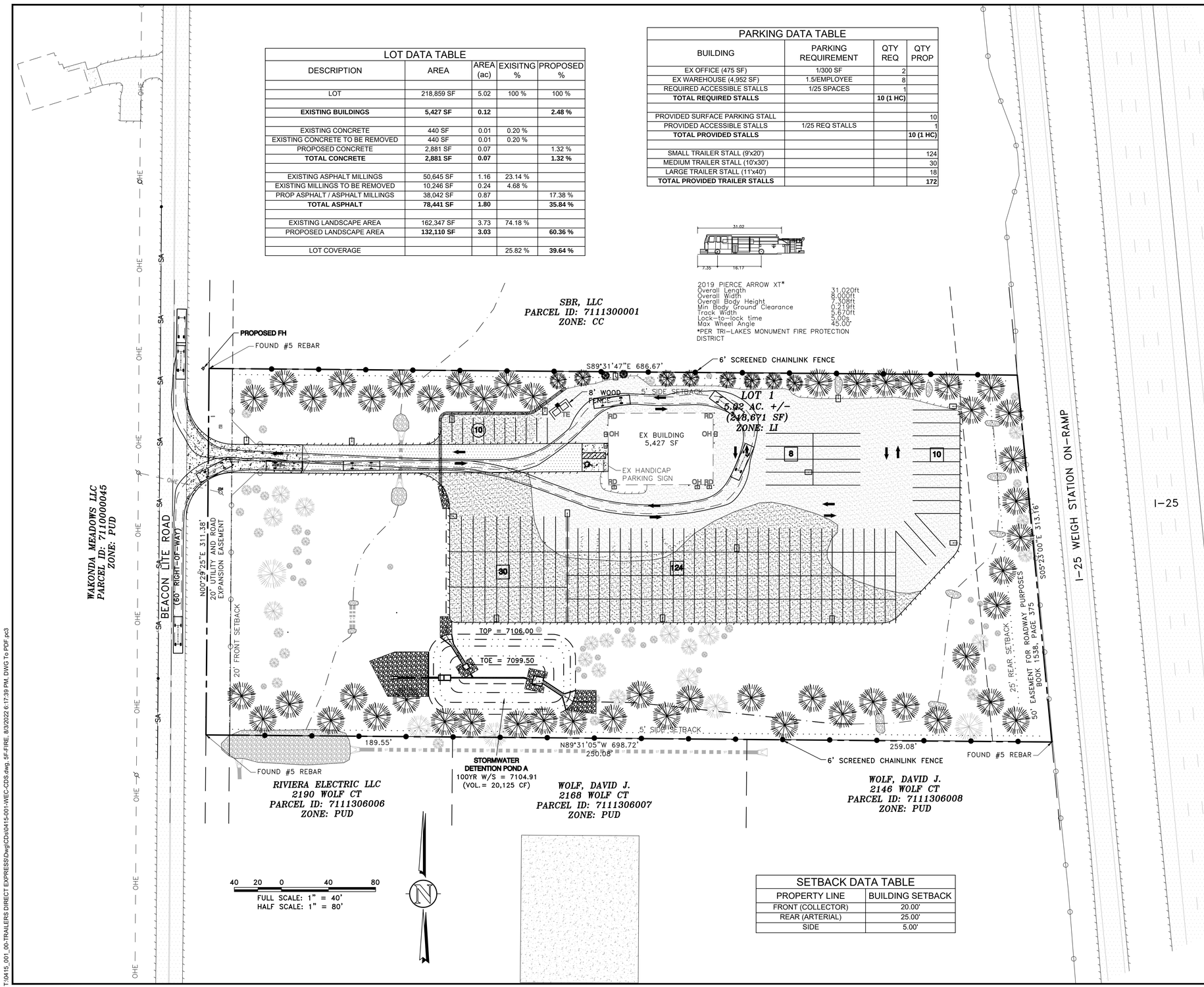
2019 PIERCE ARROW XT*

Overall Length	31.020ft
Overall Width	8.000ft
Overall Body Height	7.306ft
Min Body Ground Clearance	0.710ft
Track Width	5.670ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

*PER TRI-LAKES MONUMENT FIRE PROTECTION DISTRICT



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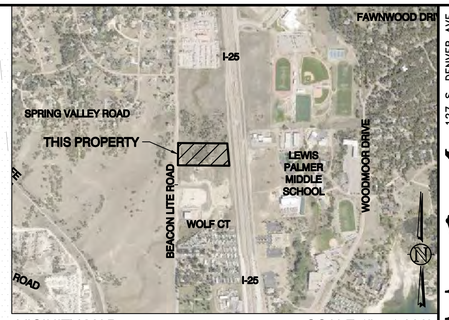

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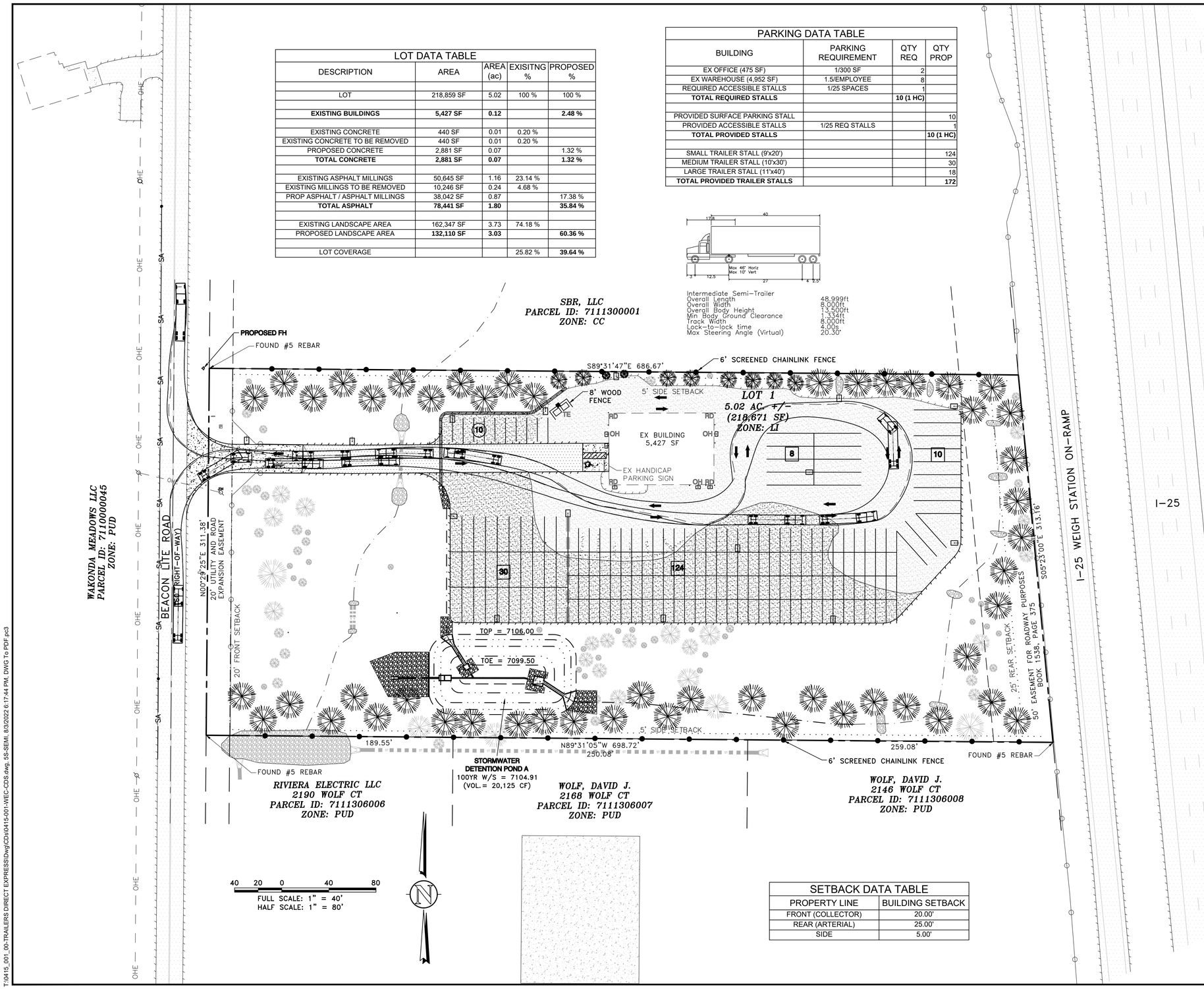
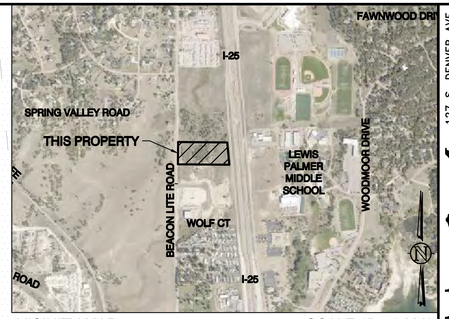
BUILDING	PARKING REQUIREMENT	QTY REQ	QTY PROP
EX OFFICE (475 SF)	1/300 SF	2	
EX WAREHOUSE (4,952 SF)	1.5/EMPLOYEE	8	
REQUIRED ACCESSIBLE STALLS	1/25 SPACES	1	
TOTAL REQUIRED STALLS		**10 (1 HC)**	
PROVIDED SURFACE PARKING STALL			10
PROVIDED ACCESSIBLE STALLS	1/25 REQ STALLS		1
TOTAL PROVIDED STALLS			**10 (1 HC)**
SMALL TRAILER STALL (9'x20')			124
MEDIUM TRAILER STALL (10'x30')			30
LARGE TRAILER STALL (11'x40')			18
TOTAL PROVIDED TRAILER STALLS			**172**

Intermediate Semi-Trailer

Overall Length	48.999ft
Overall Width	8.000ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.334ft
Track Width	8.000ft
Lock-to-lock time	4.00s
Max Steering Angle (Virtual)	20.30°



SETBACK DATA TABLE	
PROPERTY LINE	BUILDING SETBACK
FRONT (COLLECTOR)	20.00'
REAR (ARTERIAL)	25.00'
SIDE	5.00'



VICINITY MAP SCALE 1" = 1,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM AUTOCAD GEOLOCATION

NOTES

THIS PLAN IS INTENDED AS THE VEHICLE TRACKIING – SEMI PLAN FOR TRAILERS DIRECT EXPRESS.

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SEE COVER SHEET FOR BASIS OF BEARING & BENCHMARK.

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NOT ALL UNCC UTILITY LOCATES HAVE BEEN PERFORMED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES ARE LOCATED AND SURVEY PROVIDED TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION DRAWING RELEASE.

SYMBOL LEGEND

- 45 DEG BEND
- 22.5 DEG BEND
- RESTRAINED PLUG
- RESTRAINED TEE
- WATER METER
- RESTRAINED CROSS
- FIRE HYDRANT
- RESTRAINED VALVE
- UTILITY POLE
- LIGHT POLE/BLDG LIGHT
- EX EVERGREEN TREES
- THRUST BLOCK TB
- GATE VALVE GV
- CURB STOP
- PIPE CROSSING
- MANHOLE
- MANHOLE W/ FLOW DIRECTION
- RD ROOF DRAIN
- EM ELECTRIC METER
- TE TRASH ENCLOSURE
- OH OVERHEAD DOOR
- PROP EVERGREEN TREES
- 15 PROPOSED VISITOR/ EMPLOYEE PARKING
- 32 PROPOSED TRAILER PARKING
- EXISTING MILLINGS
- EXISTING CONC
- EXISTING ASPHALT
- PROPOSED GRAVEL
- PROPOSED CONC
- PROPOSED ASPHALT

LINETYPE LEGEND

- LOT / PROPERTY / SECTION LINE
- RIGHT OF WAY LINE
- EASEMENT
- SETBACK
- EXISTING BUILDING, CURB
- EDGE of ASPHALT or GRAVEL RD
- CHAINLINK FENCE
- SCREENED CHAINLINK FENCE
- WOOD FENCE
- POND WQ W/S
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- OHE — EXISTING OVERHEAD ELEC
- EL — EXISTING ELECTRICAL LINE
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PROJECT NO. 01-0415.001.00

DOC CON # 005S-SEMI

SHEET 5S OF 29

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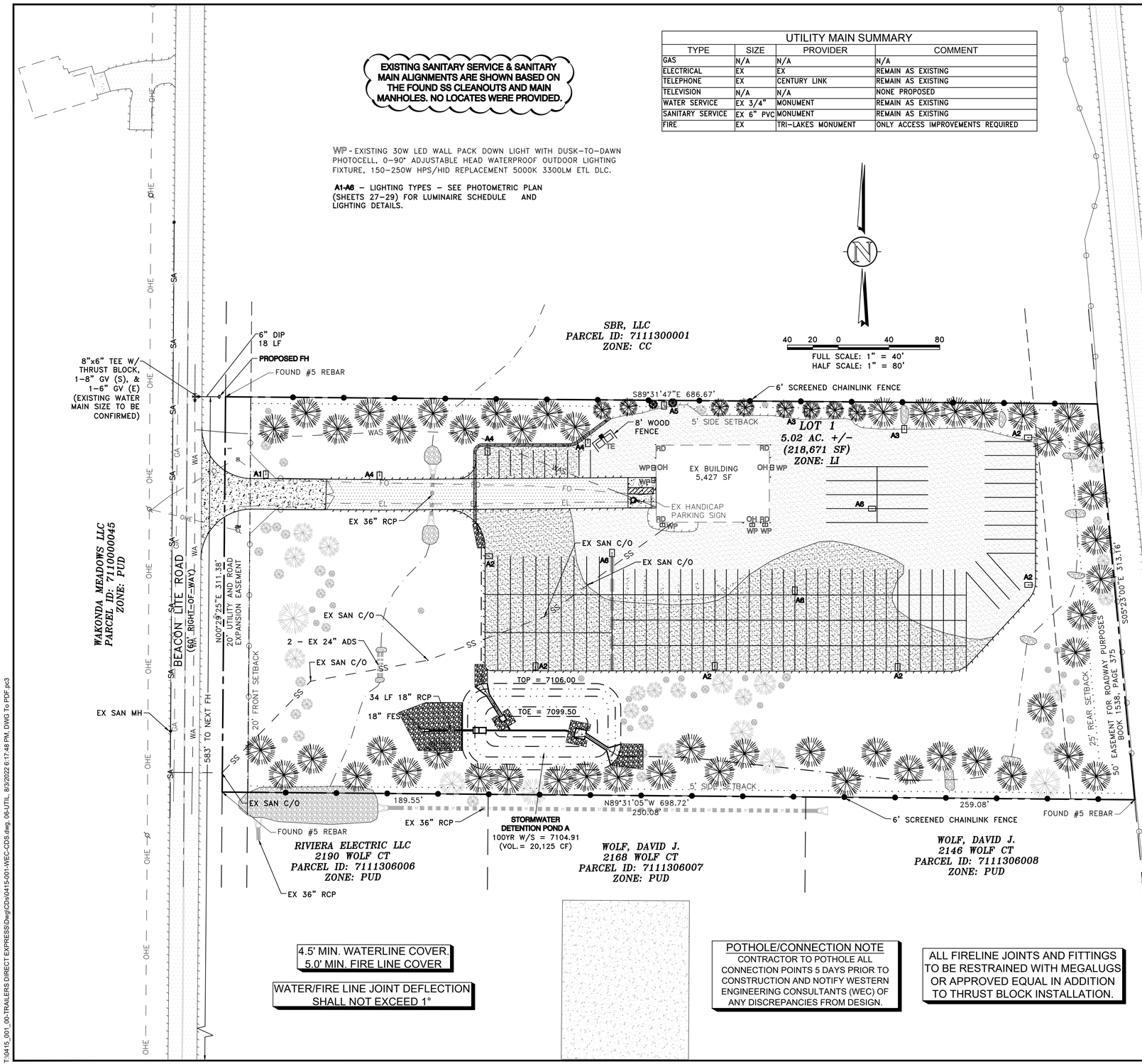
EXISTING SANITARY SERVICE & SANITARY MAIN ALIGNMENTS ARE SHOWN BASED ON THE FOUND SS CLEANOUTS AND MAIN MANHOLES. NO LOCATES WERE PROVIDED.

UTILITY MAIN SUMMARY			
TYPE	SIZE	PROVIDER	COMMENT
GAS	N/A	N/A	N/A
ELECTRICAL	EX	EX	REMAIN AS EXISTING
TELEPHONE	EX	CENTURY LINK	REMAIN AS EXISTING
TELEVISION	N/A	N/A	NONE PROPOSED
WATER SERVICE	EX 3/4"	MONUMENT	REMAIN AS EXISTING
SANITARY SERVICE	EX 6" PVC	MONUMENT	REMAIN AS EXISTING
FIRE	EX	TRI-LAKES MONUMENT	ONLY ACCESS IMPROVEMENTS REQUIRED

WP - EXISTING 30W LED WALL PACK DOWN LIGHT WITH DUSK-TO-DAWN PHOTOCELL, 0-90° ADJUSTABLE HEAD WATERPROOF OUTDOOR LIGHTING FIXTURE, 150-250W HPS/HID REPLACEMENT 5000K 3300LM ETL DLC.

A1-A6 – LIGHTING TYPES – SEE PHOTOMETRIC PLAN (SHEETS 27-29) FOR LUMINAIRE SCHEDULE AND LIGHTING DETAILS.

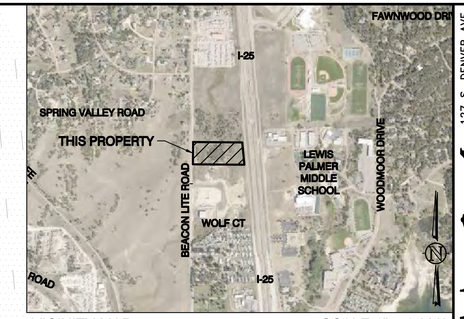


4.5' MIN. WATERLINE COVER.
5.0' MIN. FIRE LINE COVER

WATER/FIRE LINE JOINT DEFLECTION SHALL NOT EXCEED 1°

POTHOLE/CONNECTION NOTE
CONTRACTOR TO POTHOLE ALL CONNECTION POINTS 5 DAYS PRIOR TO CONSTRUCTION AND NOTIFY WESTERN ENGINEERING CONSULTANTS (WEC) OF ANY DISCREPANCIES FROM DESIGN.

ALL FIRELINE JOINTS AND FITTINGS TO BE RESTRAINED WITH MEGALUGS OR APPROVED EQUAL IN ADDITION TO THRUST BLOCK INSTALLATION.



VICINITY MAP — SCALE 1" = 1,000'
W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.
SHOWN VICINITY MAP TAKEN FROM AUTOCAD GEOLOCATION

NOTES

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- LIGHT POLE/BLDG LIGHT
- EX EVERGREEN TREES
- (15) PROPOSED VISITOR/ EMPLOYEE PARKING
- THRUST BLOCK TB
- GATE VALVE GV
- CURB STOP
- PIPE CROSSING
- MANHOLE
- MANHOLE W/ FLOW DIRECTION
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- [32] PROPOSED TRAILER PARKING
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DOC CON # 0006-UTIL
SHEET 6 OF 29

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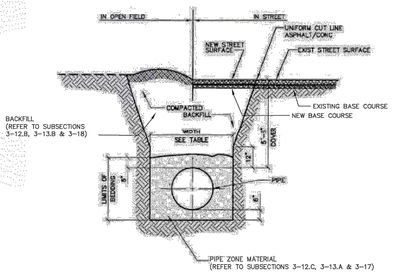

TYPICAL TRENCH SECTION

NOTES:

1. PAVING SURFACE SHALL COMPLY WITH PAVEMENT SECTION 6.
2. TRENCH WALLS TO BE SUPPORTED AS REQUIRED BY OSHA-SUBPART P.
3. MINIMUM COVER TO BE BELOW OFFICAL STREET GRADE (SEE DETAIL 1).

PIPE #	MIN WIDTH	MAX WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
12"	2'-0"	3'-0"
16"	2'-4"	3'-4"
20"	2'-8"	3'-8"
24"	4'-0"	5'-0"

TRIVIEW METROPOLITAN DISTRICT
174 N. Washington Street Suite C
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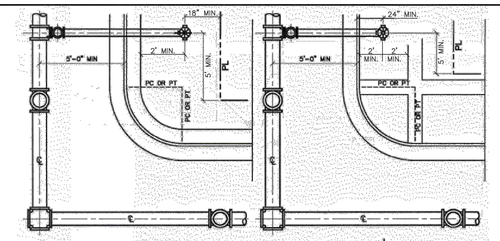
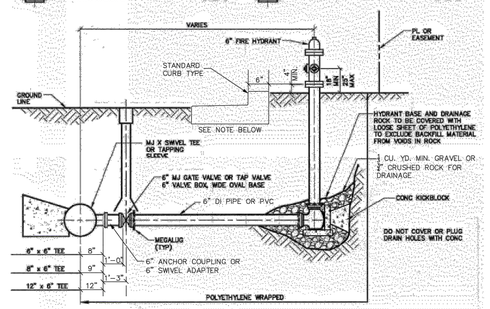
Monument, CO 80132-0849
(719) 488-6868 Fax: (719) 488-6565

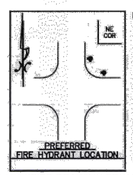
2005 MODIFIED DRAWING FROM DENVER WATER [SHEET 10]

TYPICAL TRENCH SECTION
PIPE PROTECTION

DETAIL 2







NOTE:

1. ALTERNATE TO THE ABOVE: FASTEN M.J. VALVE DIRECTLY TO A M.J. ANCHOR TEE (ALSO CALLED SWIVEL TEE).
2. FOR ACCEPTABLE FIRE HYDRANTS, SEE SUBSECTION 5-14.
3. FOR ACCEPTABLE VALVE BOXES, SEE SUBSECTION 5-16.
4. FOR ACCEPTABLE VALVES, SEE SUBSECTION 5-3.
5. NO HORIZONTAL OR VERTICAL BENDS ARE ALLOWED IN FIRE HYDRANT BRANCH OR SPRINKLER LINES, FOR EXCEPTIONS REFER TO SUBSECTION 5-19 FOR INSTALLATION INFORMATION.
6. NO VALVES ALLOWED IN SIDEWALK.

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2005 MODIFIED DRAWING FROM DENVER WATER [SHEET 7]

PLAN, PROFILE & LOCATIONS FOR
FIRE HYDRANTS, MAINS & VALVES

DETAIL 7

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FT. LUPTON, CO 80621
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email@westernec.com
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PROJECT NO. 01-0415.001.00

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SHEET 6D OF 29

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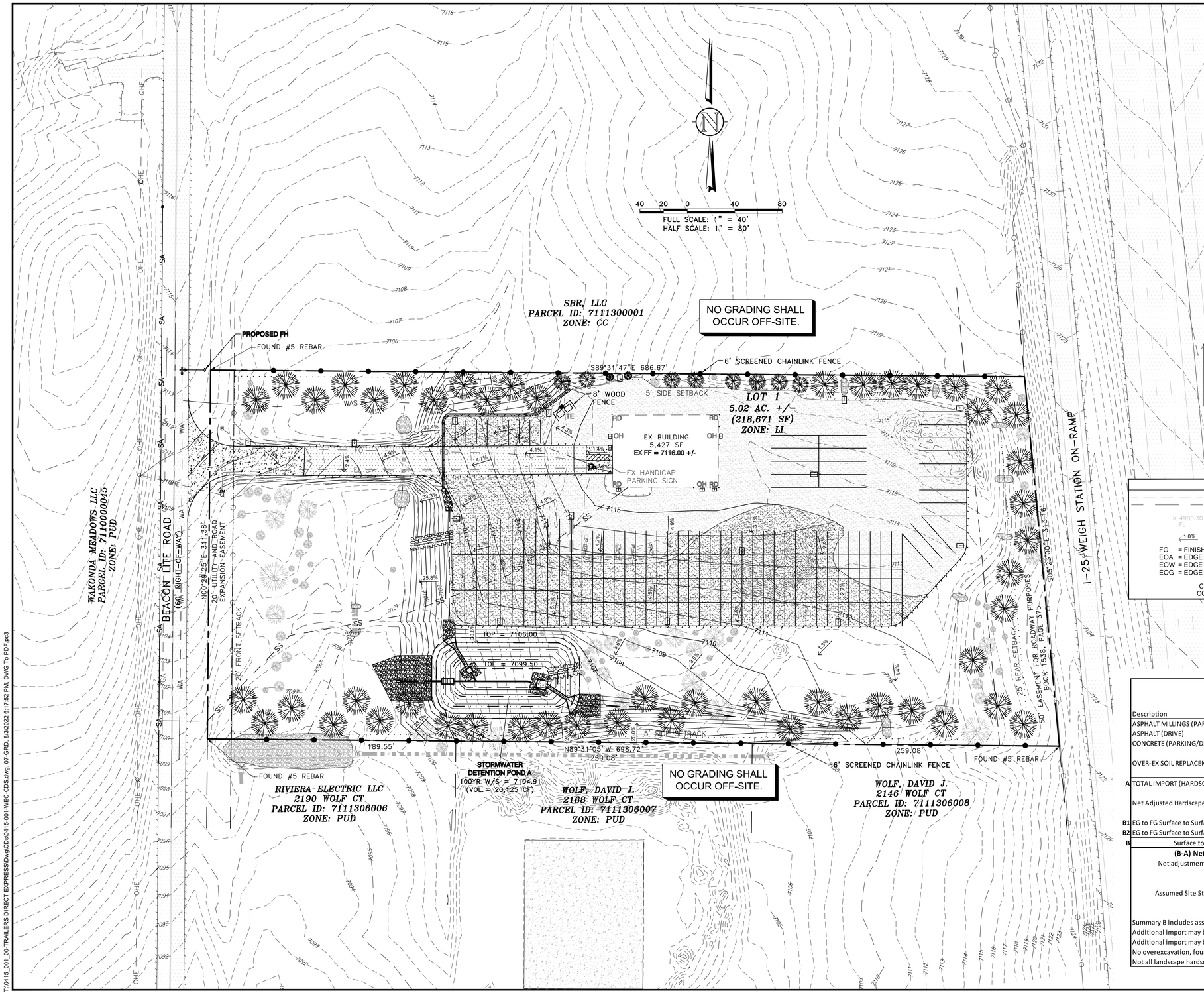

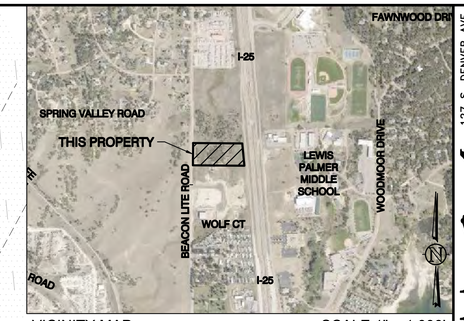

VICINITY MAP SCALE 1" = 1,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM AUTOCAD GEOLOCATION

ALL GRADING THIS PROJECT SHALL MEET THE PROJECT GEOTECHNICAL REPORT REQUIREMENTS. PERFORMED BY GEOQUEST, LLC, DATED MAY 18, 2020.

GRADING LEGEND

EXISTING MINOR CONTOUR		PROPOSED MINOR CONTOUR	
EXISTING MAJOR CONTOUR		PROPOSED MAJOR CONTOUR	
× 4980.30 FL	EXISTING SPOT ELEVATION	× 4992.30 FG	PROPOSED SPOT ELEVATION
1.0%	EXISTING SLOPE	1.0%	PROPOSED SLOPE

FG = FINISH GRADE	EG = EXISTING GRADE	EOC = EDGE OF CONCRETE
EOA = EDGE OF ASPHALT	FL = FLOWLINE	FF = FINISH FLOOR
EOW = EDGE OF WALK	HP = HIGH POINT	ME = MATCH EXISTING
EOG = EDGE OF GRAVEL	TOW = TOP OF WALL	ADA = ACCESSIBLE PARKING

CONTOURS ARE SHOWN FOR EXHIBIT PURPOSES. GRADING TO BE CONSTRUCTED PER SHOWN SPOT ELEVATIONS (SEE SHEETS 8 & 9).

TRAILERS DIRECT EXPRESS EARTHWORK SUMMARY

	Description	Area (sq. ft.)	Thickness (inches)	Volume (cubic ft)	Volume (cubic yds)	
	ASPHALT MILLINGS (PARKING)	32,335	-6.0	-16,168	(599)	
	ASPHALT (DRIVE)	5,707	-6.0	-2,854	(106)	
	CONCRETE (PARKING/DRIVE)	2,881	-6.0	-1,441	(53)	
	OVER-EX SOIL REPLACEMENT	0	0	0	-	
A	TOTAL IMPORT (HARDSCAPE)	40,923 sft		-20,462	(758)	A
		0.94 ac				
	Net Adjusted Hardscape Area	1.99 ac				
B1	EG to FG Surface to Surface net cut required (cy)				9,234	
B2	EG to FG Surface to Surface net (fill) required (cy)				(5,452)	
B	Surface to Surface net cut (fill) required (cy) after 10% fill shrinkage				3,782	B
	(B-A) Net Excess or (Shortage) cy needed in order to balance				**4,540**	**=B1-(B2+A)**
	Net adjustment to balance + raise, (lower) in feet over area noted above				1.42	
	% Unbalanced				120%	
	Assumed Site Stripping's under new asphalt, conc, bldg (4" over 40,923 sf)				505	

Summary B includes assumed 10% shrinkage of fill material
Additional import may be necessary to achieve stabilization.
Additional import may be required and an excess material condition could occur.
No overexcavation, foundation excavation, or buried utility export, has been included in this table.
Not all landscape hardscape areas have been accounted for in this table.

5/11/2022 Revision 1

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SHEET 7 OF 29

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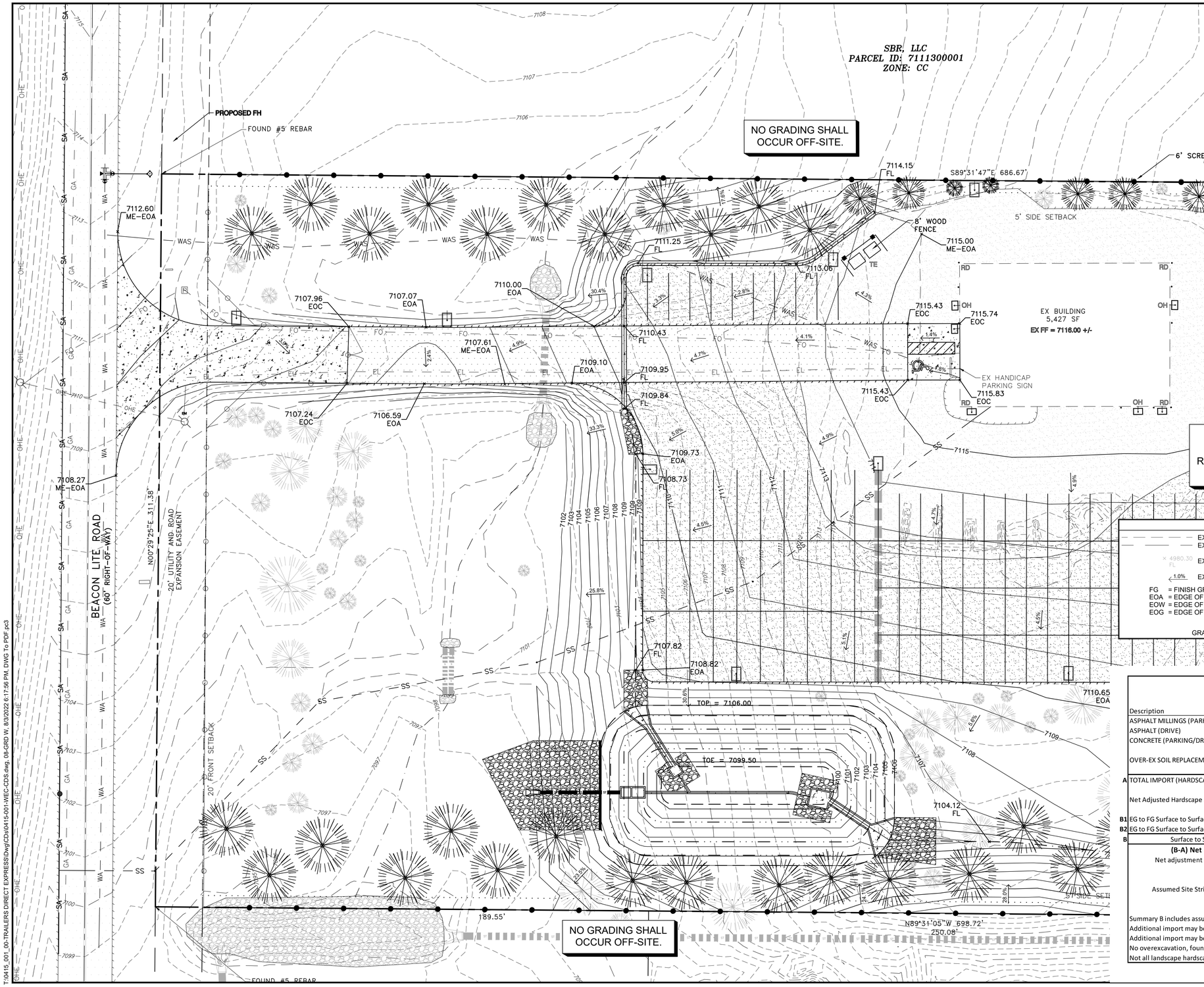

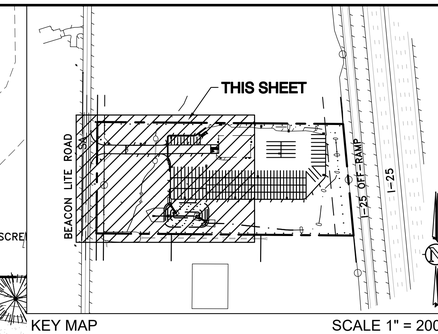

KEY MAP SCALE 1" = 200'

FULL SCALE: 1" = 20'
HALF SCALE: 1" = 40'

GRADING LEGEND

EXISTING MINOR CONTOUR	PROPOSED MINOR CONTOUR
EXISTING MAJOR CONTOUR	PROPOSED MAJOR CONTOUR
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GRADING TO BE CONSTRUCTED PER SHOWN SPOT ELEVATIONS.

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B2	EG to FG Surface to Surface net (fill) required (cy)				(5,452)	
B	Surface to Surface net cut (fill) required (cy) after 10% fill shrinkage				3,782	B
	(B-A) Net Excess or (Shortage) cy needed in order to balance				**4,540**	**=B1-(B2+A)**
	Net adjustment to balance + raise, (lower) in feet over area noted above				1.42	
	% Unbalanced				120%	
	Assumed Site Stripping's under new asphalt, conc, bldg (4" over 40,923 sf)				505	

Summary B includes assumed 10% shrinkage of fill material
Additional import may be necessary to achieve stabilization.
Additional import may be required and an excess material condition could occur.
No overexcavation, foundation excavation, or buried utility export, has been included in this table.
Not all landscape hardscape areas have been accounted for in this table.

5/11/2022 Revision 1

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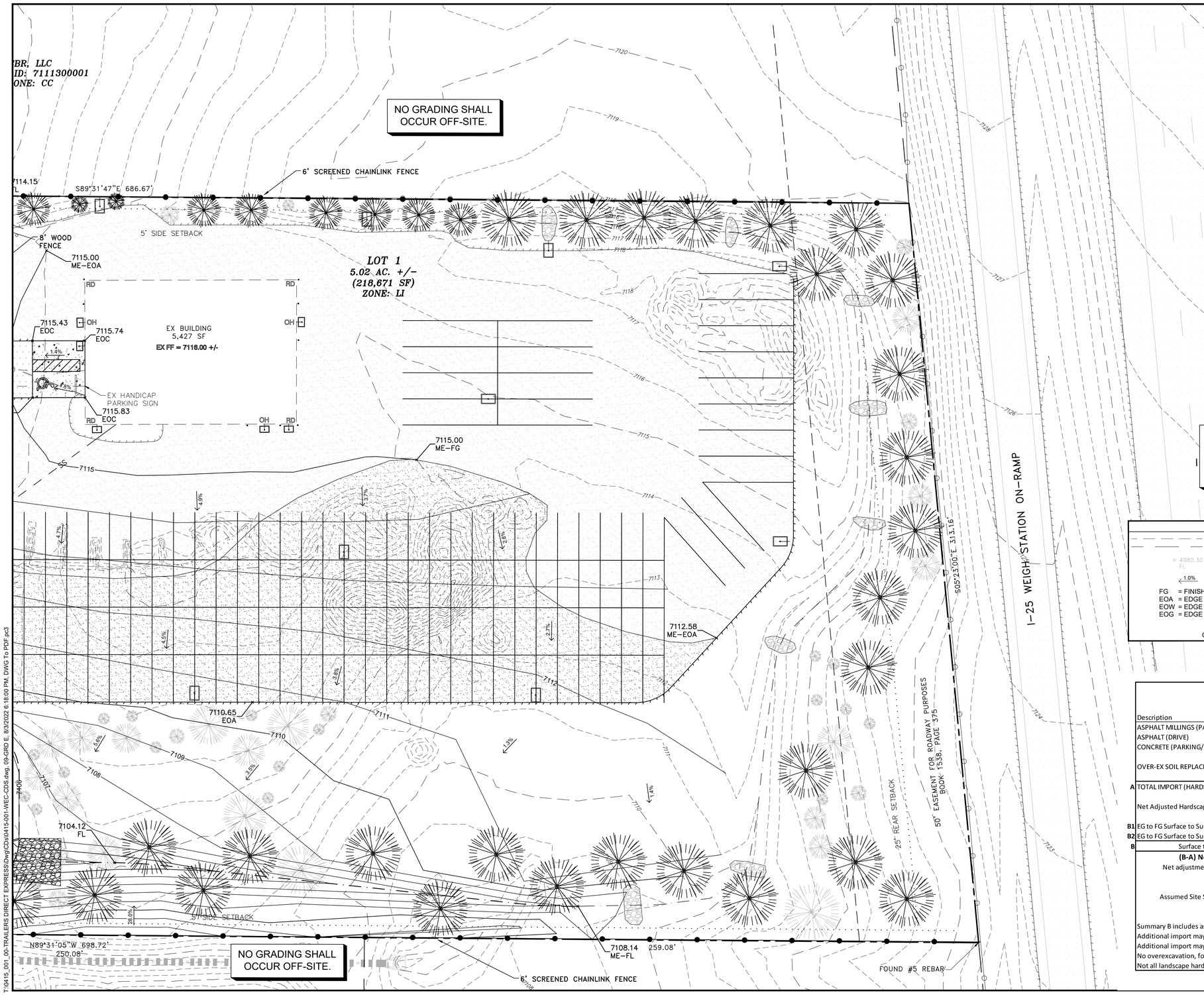

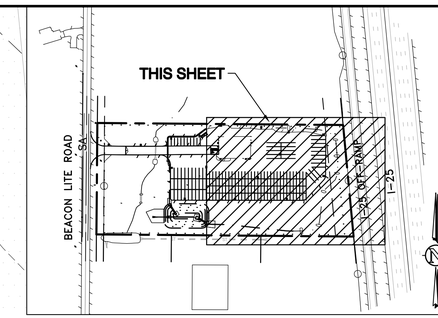

KEY MAP SCALE 1" = 200'

N

20 10 0 20 40

FULL SCALE: 1" = 20'
HALF SCALE: 1" = 40'

ALL GRADING THIS PROJECT SHALL MEET THE PROJECT GEOTECHNICAL REPORT REQUIREMENTS. PERFORMED BY GEOQUEST, LLC, DATED MAY 18, 2020.

GRADING LEGEND

EXISTING MINOR CONTOUR	PROPOSED MINOR CONTOUR
EXISTING MAJOR CONTOUR	PROPOSED MAJOR CONTOUR
× 4980.30 FL EXISTING SPOT ELEVATION	× 4992.30 FG PROPOSED SPOT ELEVATION
1.0% EXISTING SLOPE	1.0% PROPOSED SLOPE

FG = FINISH GRADE	EG = EXISTING GRADE	EOC = EDGE OF CONCRETE
EOA = EDGE OF ASPHALT	FL = FLOWLINE	FF = FINISH FLOOR
EOW = EDGE OF WALK	HP = HIGH POINT	ME = MATCH EXISTING
EOG = EDGE OF GRAVEL	TOW = TOP OF WALL	ADA = ACCESSIBLE PARKING

CONTOURS ARE SHOWN FOR EXHIBIT PURPOSES.
GRADING TO BE CONSTRUCTED PER SHOWN SPOT ELEVATIONS.

TRAILERS DIRECT EXPRESS EARTHWORK SUMMARY

	Description	Area (sq. ft.)	Thickness (inches)	Volume (cubic ft)	Volume (cubic yds)	
	ASPHALT MILLINGS (PARKING)	32,335	-6.0	-16,168	(599)	
	ASPHALT (DRIVE)	5,707	-6.0	-2,854	(106)	
	CONCRETE (PARKING/DRIVE)	2,881	-6.0	-1,441	(53)	
	OVER-EX SOIL REPLACEMENT	0	0	0	-	
A	TOTAL IMPORT (HARDSCAPE)	40,923 sft 0.94 ac		-20,462	(758)	A
	Net Adjusted Hardscape Area	1.99 ac				
B1	EG to FG Surface to Surface net cut required (cy)				9,234	
B2	EG to FG Surface to Surface net (fill) required (cy)				(5,452)	
B	Surface to Surface net cut (fill) required (cy) after 10% fill shrinkage				3,782	B
	(B-A) Net Excess or (Shortage) cy needed in order to balance				**4,540**	**=B1-(B2+A)**
	Net adjustment to balance + raise, (lower) in feet over area noted above				1.42	
	% Unbalanced				120%	
	Assumed Site Stripping's under new asphalt, conc, bldg (4" over 40,923 sf)				505	

Summary B includes assumed 10% shrinkage of fill material
Additional import may be necessary to achieve stabilization.
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No overexcavation, foundation excavation, or buried utility export, has been included in this table.
Not all landscape hardscape areas have been accounted for in this table.

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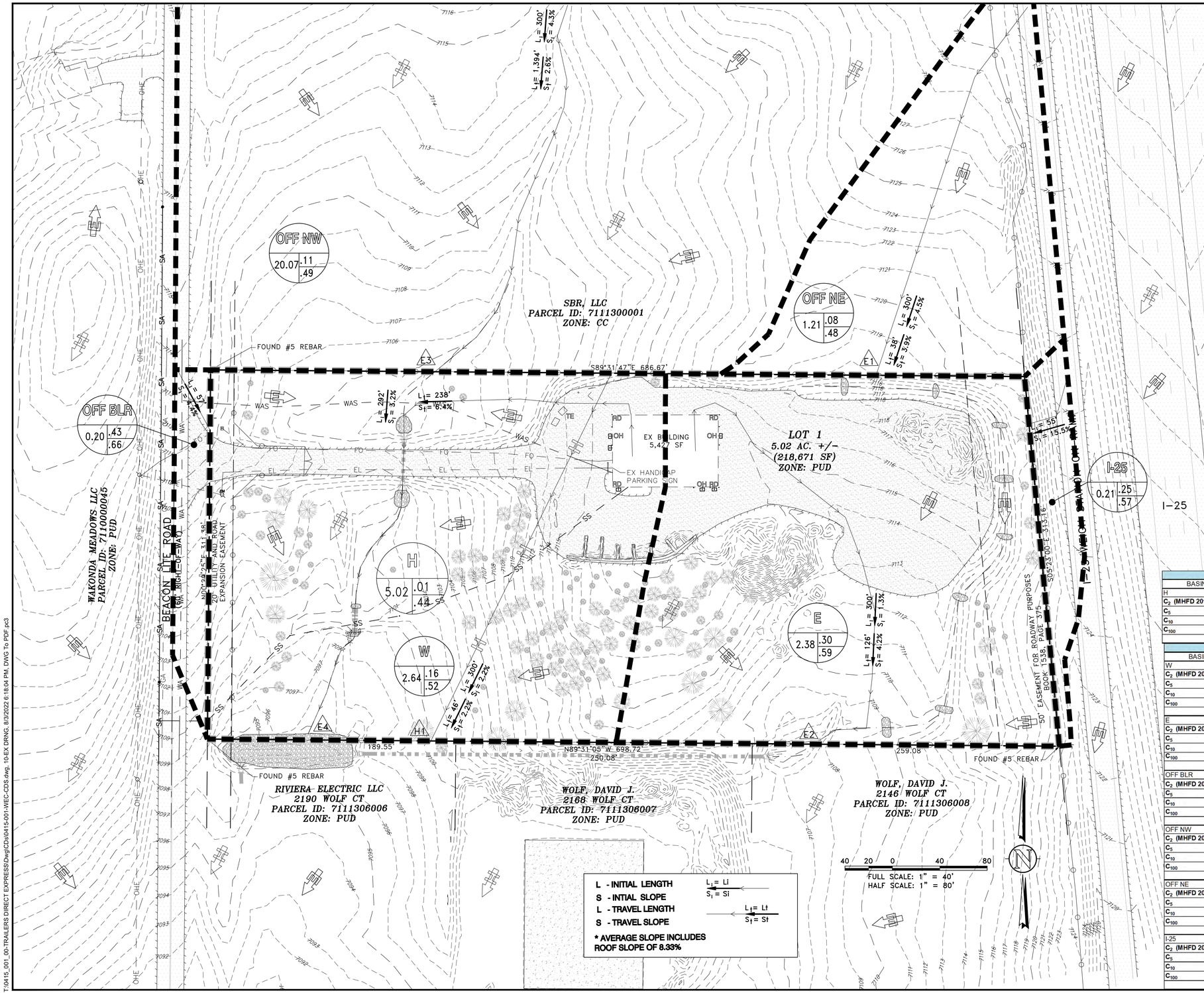

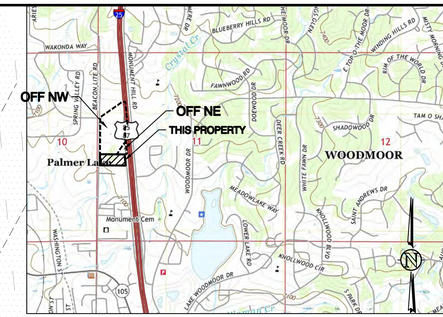

VICINITY MAP SCALE 1" = 2,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM USGS QUAD MAP - MONUMENT 7.5 MIN

EXISTING DRAINAGE LEGEND

- E — EXISTING SUB-BASIN DESIGNATION
- 1.12 — AREA IN ACRES
- .73 — C5
- .83 — C100
- 8 — DESIGN POINT
- EXISTING BASIN
- EXISTING DRAINAGE PATTERN

HISTORIC DRAINAGE LEGEND

- H — HISTORIC SUB-BASIN DESIGNATION
- 1.12 — AREA IN ACRES
- .73 — C5
- .83 — C100
- HISTORIC BASIN
- HISTORIC DRAINAGE PATTERN

Historic Runoff Table - Trailers Direct Express

BASIN	Impervious	C-YR	I	A	CIA(YR-historic)	Flow	DESIGN POINT
H							
C_2 (MHFD 2018)	2.00	0.01	1.49	5.02	0.08	cfs	H1
C_5	2.00	0.01	2.00	5.02	0.10	cfs	
C_{10}	2.00	0.07	2.43	5.02	0.85	cfs	
C_{100}	2.00	0.44	4.20	5.02	9.27	cfs	

Existing Runoff Table - Trailers Direct Express

BASIN	Impervious	C-YR	I	A	CIA(YR-existing)	Flow	DESIGN POINT
W							
C_2 (MHFD 2018)	19.80	0.16	1.87	2.64	0.79	cfs	E2
C_5	19.80	0.16	2.51	2.64	1.09	cfs	
C_{10}	19.80	0.21	3.05	2.64	1.72	cfs	
C_{100}	19.80	0.52	5.27	2.64	7.26	cfs	
E							
C_2 (MHFD 2018)	35.14	0.29	1.82	2.38	1.25	cfs	E4
C_5	35.14	0.30	2.43	2.38	1.72	cfs	
C_{10}	35.14	0.34	2.96	2.38	2.37	cfs	
C_{100}	35.14	0.59	5.10	2.38	7.19	cfs	
OFF BLR							
C_2 (MHFD 2018)	50.91	0.42	2.81	0.19	0.23	cfs	
C_5	50.91	0.43	3.76	0.19	0.31	cfs	
C_{10}	50.91	0.46	4.57	0.19	0.40	cfs	
C_{100}	50.91	0.66	7.89	0.19	1.00	cfs	
OFF NW							
C_2 (MHFD 2018)	14.05	0.11	1.32	20.07	2.81	cfs	E1
C_5	14.05	0.11	1.77	20.07	3.96	cfs	
C_{10}	14.05	0.17	2.15	20.07	7.25	cfs	
C_{100}	14.05	0.49	3.72	20.07	36.90	cfs	
OFF NE							
C_2 (MHFD 2018)	10.12	0.08	1.75	1.21	0.17	cfs	E3
C_5	10.12	0.08	2.34	1.21	0.23	cfs	
C_{10}	10.12	0.14	2.85	1.21	0.47	cfs	
C_{100}	10.12	0.48	4.91	1.21	2.85	cfs	
I-25							
C_2 (MHFD 2018)	29.38	0.24	2.93	0.21	0.15	cfs	
C_5	29.38	0.25	3.92	0.21	0.20	cfs	
C_{10}	29.38	0.29	4.77	0.21	0.29	cfs	
C_{100}	29.38	0.57	8.23	0.21	0.98	cfs	

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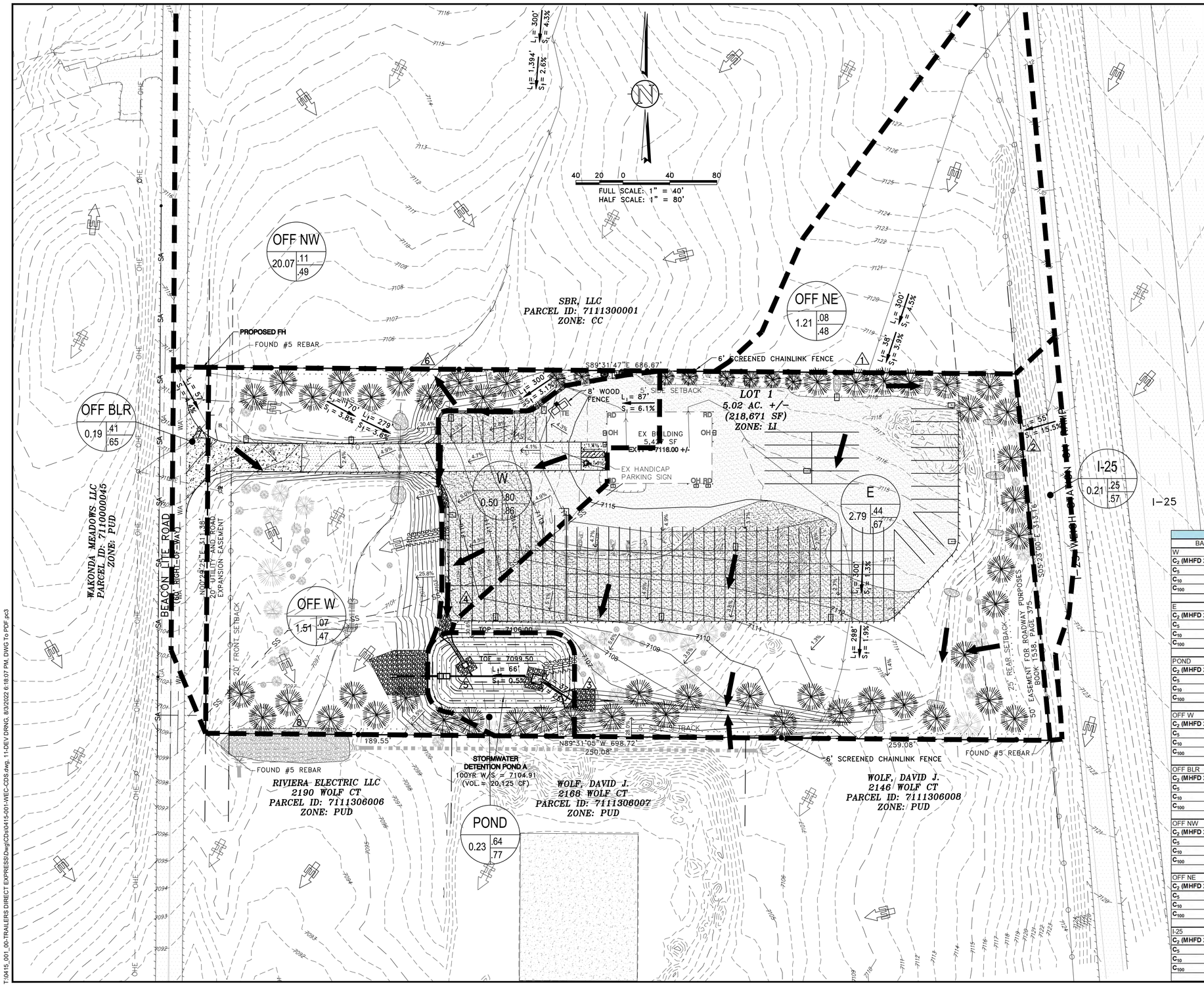

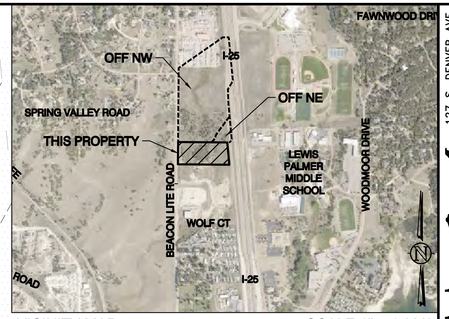

VICINITY MAP SCALE 1" = 1,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM AUTOCAD GEOLOCATION

DEVELOPED DRAINAGE LEGEND

B1 — SUB-BASIN DESIGNATION

3.20 — AREA IN ACRES

.58 — C5

.88 — C100

DEVELOPED BASIN

PROPOSED DRAINAGE PATTERN

DESIGN POINT

EMERGENCY OVERFLOW

L - INITIAL LENGTH

S - INTIAL SLOPE

L - TRAVEL LENGTH

S - TRAVEL SLOPE

$L_I = L_i$, $S_I = S_i$

$L_t = L_t$, $S_t = S_t$

* AVERAGE SLOPE INCLUDES ROOF SLOPE OF 8.33%

Developed Runoff Table - Trailers Direct Express

BASIN	Impervious	C-YR	I	A	CIA(YR-DEVELOPED)	cfs	DESIGN POINT
W							
C_2 (MHFD 2018)	92.99	0.78	3.04	0.50	1.20	cfs	4
C_5	92.99	0.80	4.07	0.50	1.64	cfs	
C_{10}	92.99	0.80	4.95	0.50	2.01	cfs	
C_{100}	92.99	0.86	8.55	0.50	3.70	cfs	
E							
C_2 (MHFD 2018)	51.36	0.43	1.79	2.79	2.13	cfs	3
C_5	51.36	0.44	2.39	2.79	2.92	cfs	
C_{10}	51.36	0.47	2.91	2.79	3.79	cfs	
C_{100}	51.36	0.67	5.02	2.79	9.33	cfs	
POND							
C_2 (MHFD 2018)	74.31	0.62	3.04	0.23	0.43	cfs	5
C_5	74.31	0.64	4.07	0.23	0.59	cfs	
C_{10}	74.31	0.65	4.95	0.23	0.74	cfs	
C_{100}	74.31	0.77	8.55	0.23	1.51	cfs	
OFF W							
C_2 (MHFD 2018)	9.01	0.07	1.86	1.51	0.19	cfs	8
C_5	9.01	0.07	2.48	1.51	0.26	cfs	
C_{10}	9.01	0.13	3.02	1.51	0.58	cfs	
C_{100}	9.01	0.47	5.22	1.51	3.71	cfs	
OFF BLR							7
C_2 (MHFD 2018)	48.65	0.41	2.78	0.19	0.21	cfs	
C_5	48.65	0.41	3.72	0.19	0.29	cfs	
C_{10}	48.65	0.45	4.53	0.19	0.38	cfs	
C_{100}	48.65	0.65	7.82	0.19	0.97	cfs	
OFF NW							
C_2 (MHFD 2018)	14.05	0.11	1.32	20.07	2.81	cfs	6
C_5	14.05	0.11	1.77	20.07	3.96	cfs	
C_{10}	14.05	0.17	2.15	20.07	7.25	cfs	
C_{100}	14.05	0.49	3.72	20.07	36.90	cfs	
OFF NE							
C_2 (MHFD 2018)	10.12	0.08	1.75	1.21	0.17	cfs	1
C_5	10.12	0.08	2.34	1.21	0.23	cfs	
C_{10}	10.12	0.14	2.85	1.21	0.47	cfs	
C_{100}	10.12	0.48	4.91	1.21	2.85	cfs	
I-25							2
C_2 (MHFD 2018)	29.38	0.24	2.93	0.21	0.15	cfs	
C_5	29.38	0.25	3.92	0.21	0.20	cfs	
C_{10}	29.38	0.29	4.77	0.21	0.29	cfs	
C_{100}	29.38	0.57	8.23	0.21	0.98	cfs	

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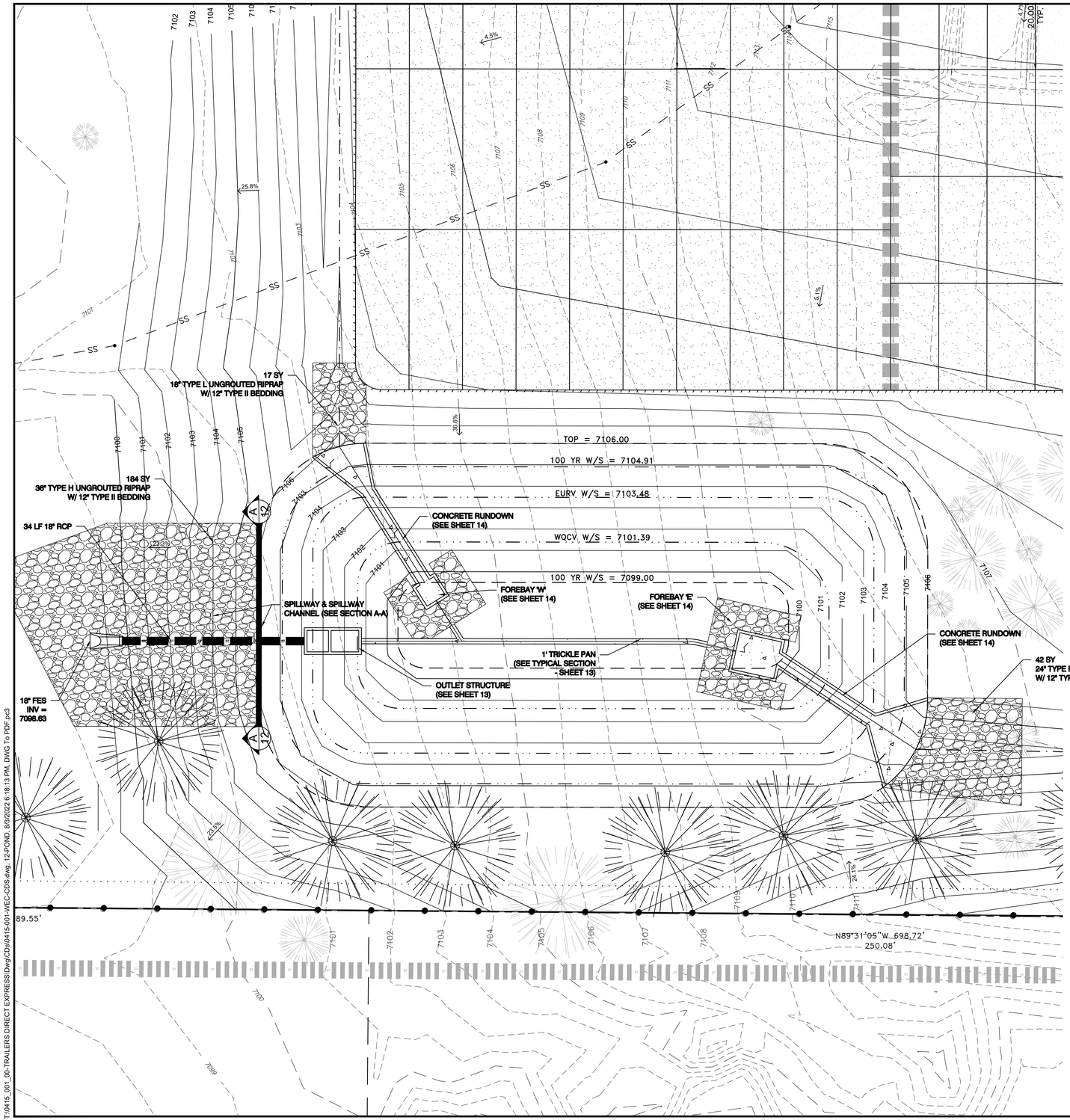
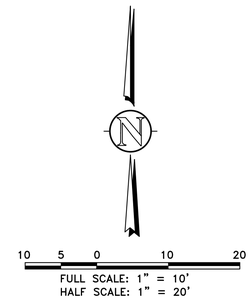
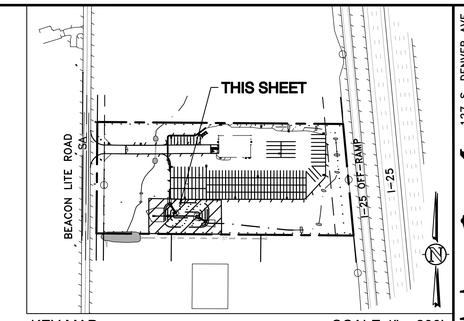
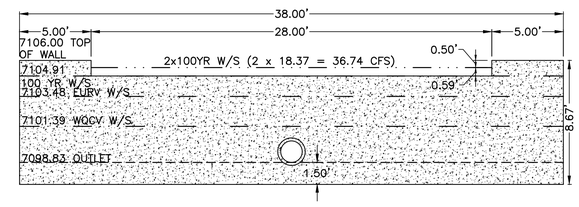






KEY MAP SCALE 1" = 200'

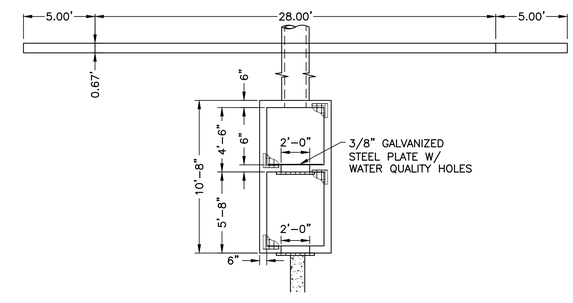
POND WATER SURFACE TABLE			
DESCRIPTION	REQUIRED VOLUME (cft)	PROVIDED VOLUME (cft)	ELEVATION
WQCV	3,702.6	3,702.6	7101.39
EURV	11,499.8	11,499.8	7103.48
100yr	20,124.7	20,124.7	7104.91
TOP OVERFLOW	--	29,196.0	7106.00

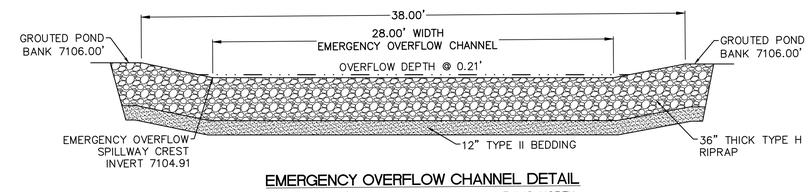


DETENTION POND SPILLWAY WALL WEIR (8" THICK)

PROFILE VIEW - SECTION A-A

SCALE 1" = 5'





EMERGENCY OVERFLOW CHANNEL DETAIL

SCALE 1" = 5' VIEW IS NORTH

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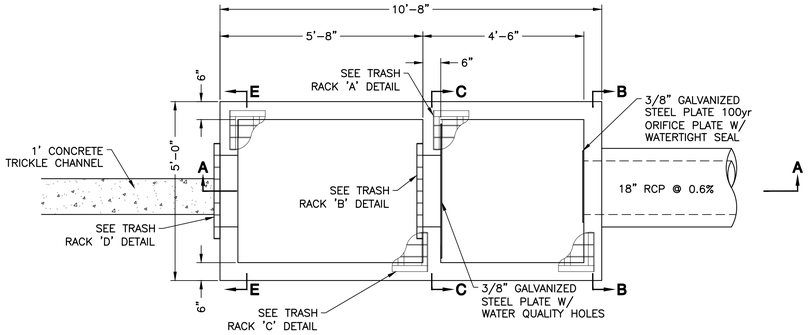
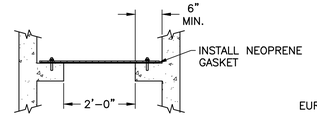
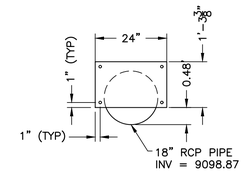
POND WATER SURFACE TABLE			
DESCRIPTION	REQUIRED VOLUME (cft)	PROVIDED VOLUME (cft)	ELEVATION
WQCV	3,702.6	3,702.6	7101.39
EURV	11,499.8	11,499.8	7103.48
100yr	20,124.7	20,124.7	7104.91
TOP OVERFLOW	--	29,196.0	7106.00



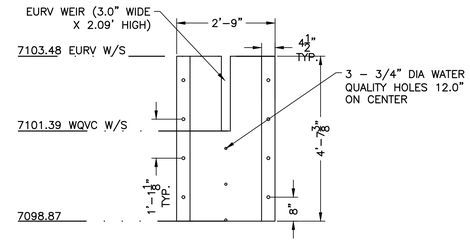
PLAN VIEW
SCALE 1" = 2'



SECTION D-D
SCALE 1" = 2'



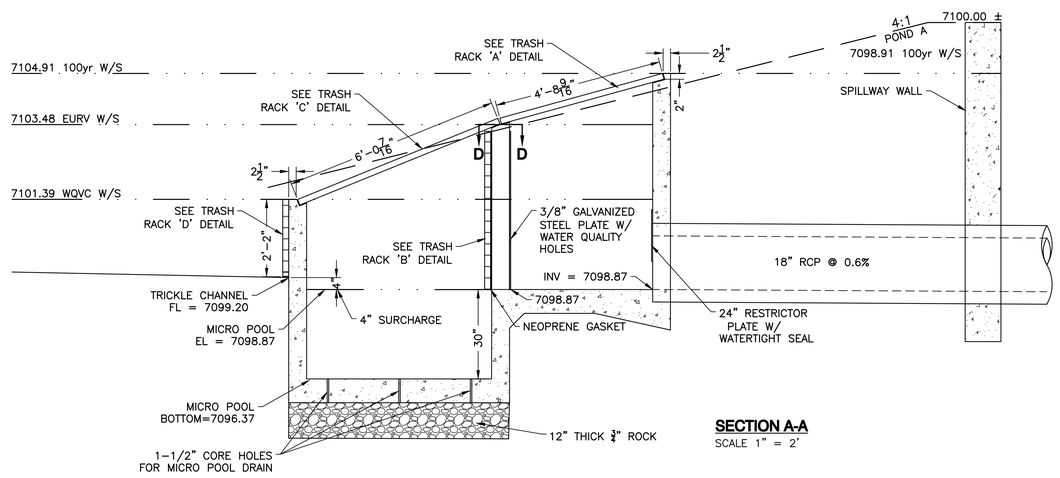
3/8" GALVANIZED STEEL PLATE 100yr ORIFICE PLATE W/ WATERTIGHT SEAL
SCALE 1" = 2'



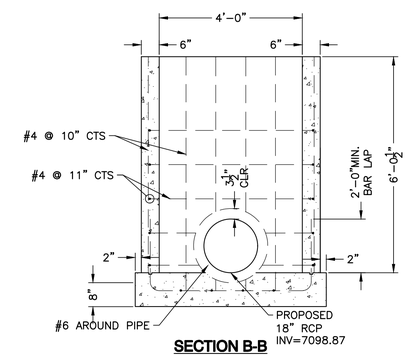
3/8" GALVANIZED STEEL PLATE W/ WATER QUALITY HOLES
SCALE 1" = 2'

STRUCTURAL NOTES:

1. ALL CONCRETE SHALL BE C.D.O.T. CLASS B CAST IN PLACE.
2. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFER 3/4".
3. ALL REINFORCING BARS SHALL HAVE A MINIMUM 2" CLEARANCE.
4. ALL REINFORCING BARS SHALL BE EPOXY COATED.
5. ALL STEPS SHALL BE IN ACCORDANCE WITH AASHTO M199.



SECTION A-A
SCALE 1" = 2'



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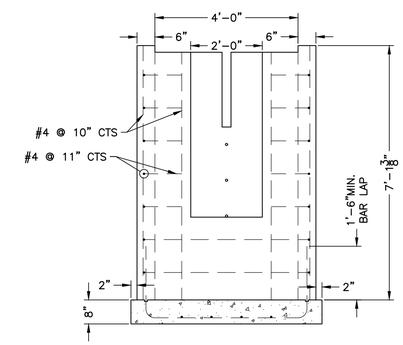
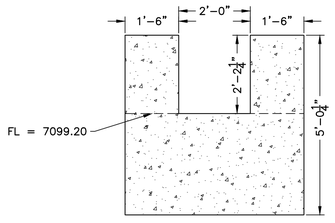
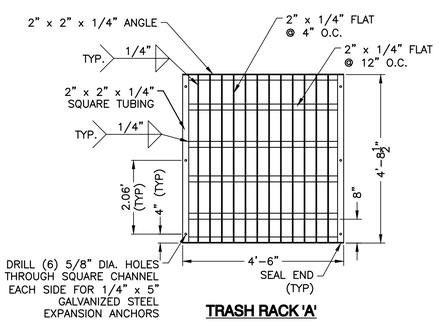
SCALE 1" = 2'



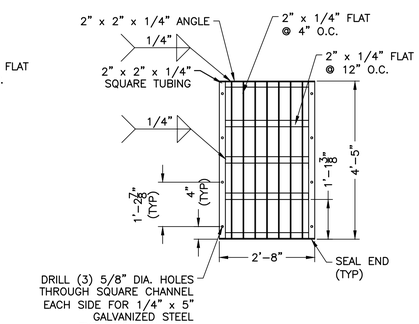
SECTION C-C
SCALE 1" = 2'



SECTION E-E
SCALE 1" = 2'



TRASH RACK 'A'
SCALE 1" = 2'



TRASH RACK 'B'
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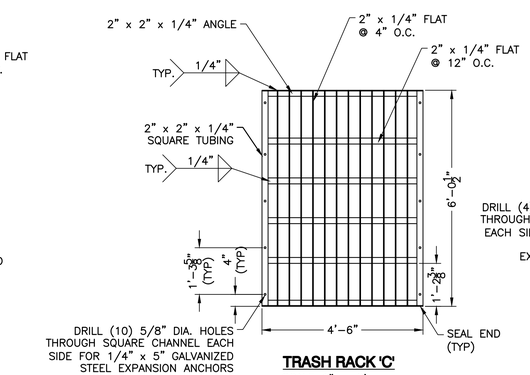
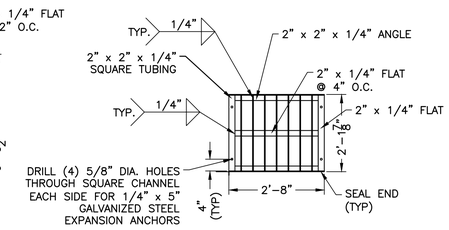


TRASH RACK 'C'
SCALE 1" = 2'



TRASH RACK 'D'
SCALE 1" = 2'

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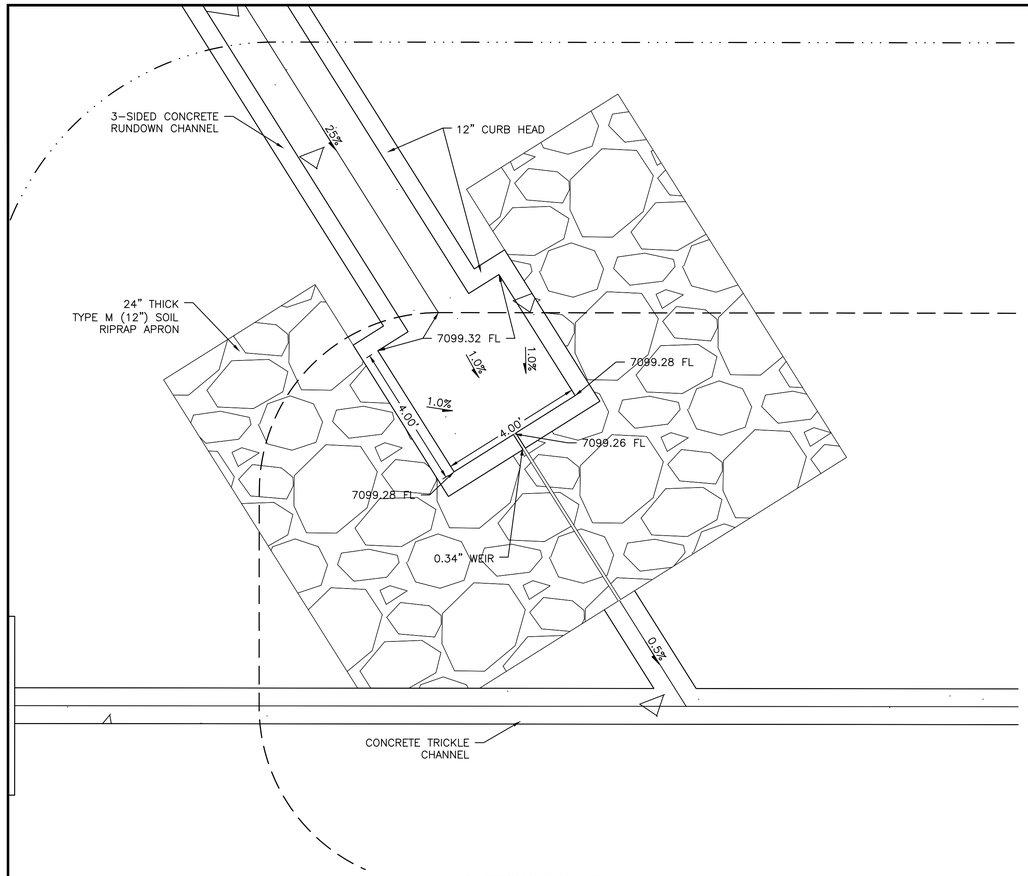
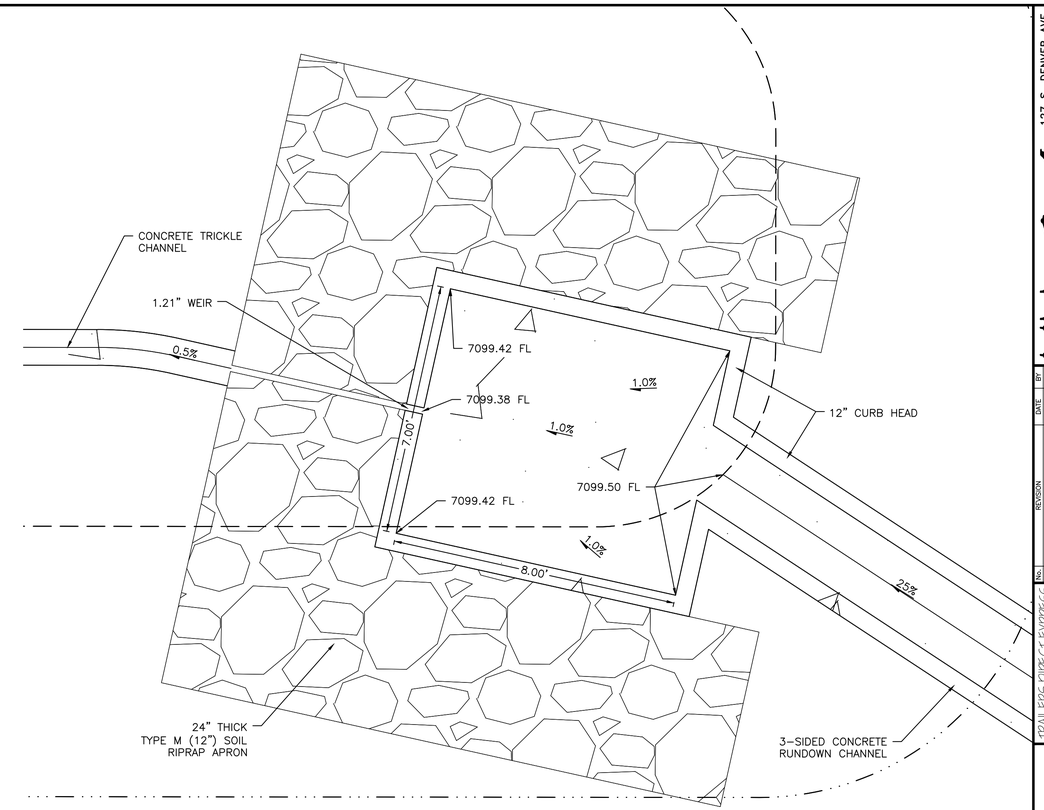


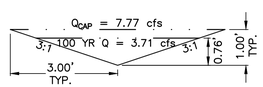
FOREBAY W (4' x 4')

SCALE 1" = 2'



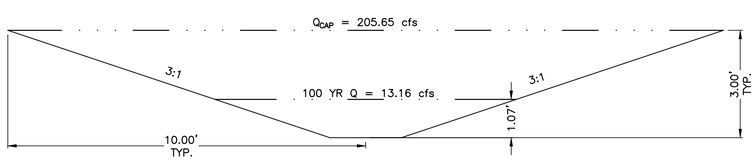
FOREBAY E (8' x 7')

SCALE 1" = 2'



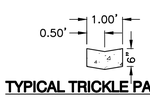
WEST DITCH SECTION

SCALE 1" = 2'



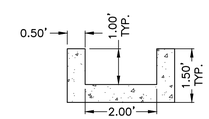
SOUTH/EAST DITCH SECTION

SCALE 1" = 2'



TYPICAL TRICKLE PAN DETAIL

SCALE 1" = 2'



TYPICAL CONCRETE CHANNEL

SCALE 1" = 2'

BEDDING GRADATION

UDFCD Table MD-11		
	Percent Weight by Passing Square-Mesh Sieves	
U.S. Standard Sieve Size	Type I CDOT Sect. 703.01	Type II CDOT Sect. 703.09 Class A
3 inches	-----	90-100
1 1/2 inches	-----	-----
3/4 inches	-----	20-90
3/8 inches	100	-----
#4	95-100	0-20
#16	45-80	-----
#50	10-30	-----
#100	2-10	-----
#200	0-2	0-3

Classification & Gradation of Ordinary Riprap UDFCD Table MD-7			
Riprap Designation	% Smaller Than Given Size by Weight	Intermediate Rock Dimensions (inches)	d50 (inches)*
Type VL	70–100 50–70 35–50 2–10	12 9 6 2	6**
Type L	70–100 50–70 35–50 2–10	15 12 9 3	9**
Type M	70–100 50–70 35–50 2–10	21 18 12 4	12**
Type H	70–100 50–70 35–50 2–10	30 24 18 6	18

SOIL RIPRAP

70%-75% RIPRAP
25%-30% SOIL

RIPRAP BEDDING REQUIREMENTS

UDFCD Table MD-12 (Volume 1)			
	Minimum Bedding Thickness (inches)		
	Fine-Grained Soils*		Coarse-Grained soils**
Riprap Designation	Type I	Type II	Type II
VL (d_{50} =6 in), L (d_{50}=9 in)	4	4	6
M (d_{50} =12 in)	4	4	6
H (d_{50} =18 in)	4	6	8
VH (d_{50} =24 in)	4	6	8

* May substitute one 12-inch layer of type II bedding. The substitution of one layer of type II bedding shall not be permitted at drop structures. The use of a combination of filter fabric and Type II bedding at drop structures is acceptable.

**Fifty percent or more by weight retained on the #40 sieve.

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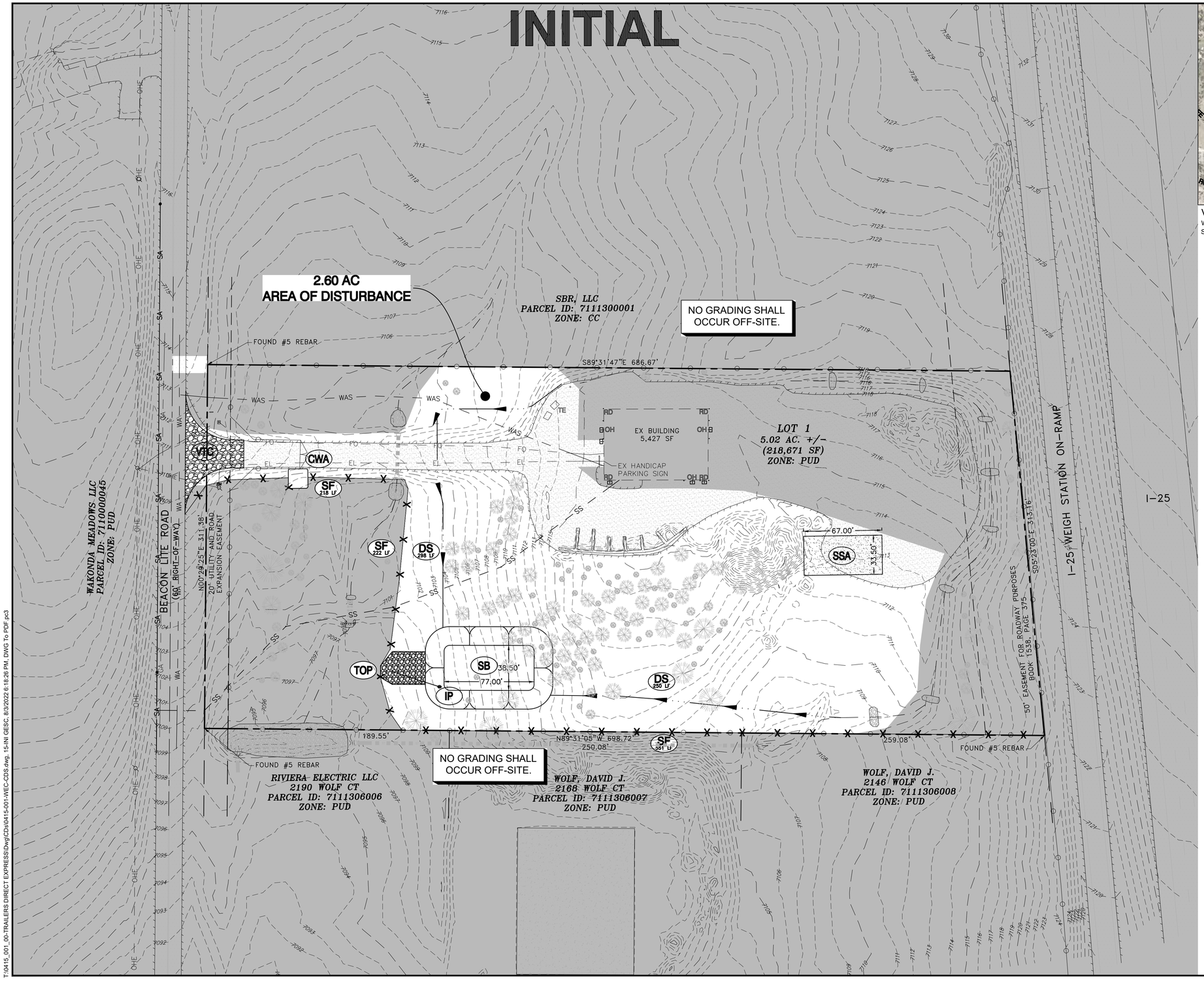

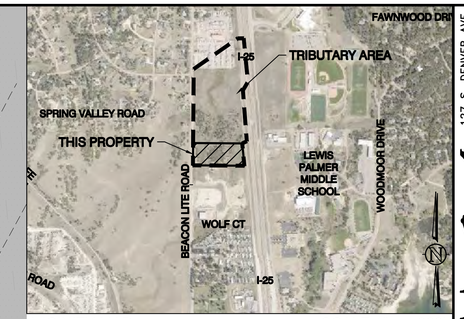

VICINITY MAP SCALE 1" = 1,000'

W 1/2, W 1/2, S11, T11S, R67W, 6th P.M.

SHOWN VICINITY MAP TAKEN FROM AUTOCAD GEOLOCATION

40 20 0 40 80

FULL SCALE: 1" = 40'

HALF SCALE: 1" = 80'

STANDARD SEDIMENT BASIN

UPSTREAM DRAINAGE AREA (acres): 5
BASIN BOTTOM WIDTH (ft): 38.50
SPILLWAY CREST LENGTH (ft): 8
HOLE DIAMETER (inches): 21/32"
NUMBER COLUMNS: 1
BASIN BOTTOM ELEVATION: 7102'
BASIN SPILLWAY ELEVATION: 7105'
BASIN TOP ELEVATION: 7106'

BMP LEGEND

CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
CIP	CULVERT INLET PROTECTION
DC	WIND EROSION & DUST CONTROL
DS	DRAINAGE SWALE
GH	GOOD HOUSEKEEPING PRACTICE
IP	INLET PROTECTION
PS	PERMANENT SEEDING
RS	ROCK SOCK
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
SF	SILT FENCE
SM	STOCKPILE MANAGEMENT
SS	STREET SWEEPING VACUMMING
SSA	STABILIZED STAGING AREA
AP	AGGREGATE (NON-SOIL) PILE
TOP	TEMPORARY OUTLET PROTECTION
ECB	EROSION CONTROL BLANKET
VTC	VEHICLE TRACKING CONTROL

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INTERIM

2.60 AC
AREA OF DISTURBANCE

PROPOSED FH
FOUND #5 REBAR

SBR, LLC
PARCEL ID: 7111300001
ZONE: CC

NO GRADING SHALL OCCUR OFF-SITE.

S89°31'47"E 686.67'

6' SCREENED CHAINLINK FENCE

8' WOOD FENCE

5' SIDE SETBACK

LOT 1
5.02 AC. +/-
(218,671 SF)
ZONE: LI

EX BUILDING
5,427 SF

EX HANDICAP PARKING SIGN

WAKONDA MEADOWS LLC
PARCEL ID: 7110000045
ZONE: PUD

BEACON LITE ROAD
(60' RIGHT-OF-WAY)

N00°29'25"E 311.36'

20' UTILITY AND ROAD EXPANSION EASEMENT

20' FRONT SETBACK

TOP = 7106.00

TOE = 7099.50

189.55'

N89°31'05"W 698.72'
250.08'

259.08'

FOUND #5 REBAR

NO GRADING SHALL OCCUR OFF-SITE.

RIVIERA ELECTRIC LLC
2190 WOLF CT
PARCEL ID: 7111306006
ZONE: PUD

WOLF, DAVID J.
2168 WOLF CT
PARCEL ID: 7111306007
ZONE: PUD

WOLF, DAVID J.
2146 WOLF CT
PARCEL ID: 7111306008
ZONE: PUD

6' SCREENED CHAINLINK FENCE

FOUND #5 REBAR

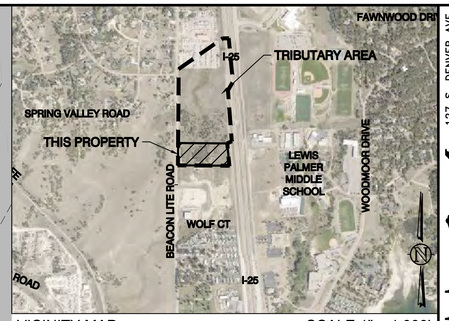
25' REAR SETBACK

50' EASEMENT FOR ROADWAY PURPOSES
BOOK 1538, PAGE 375

S05°23'00"E 313.16'

I-25 WEIGH STATION ON-RAMP

I-25



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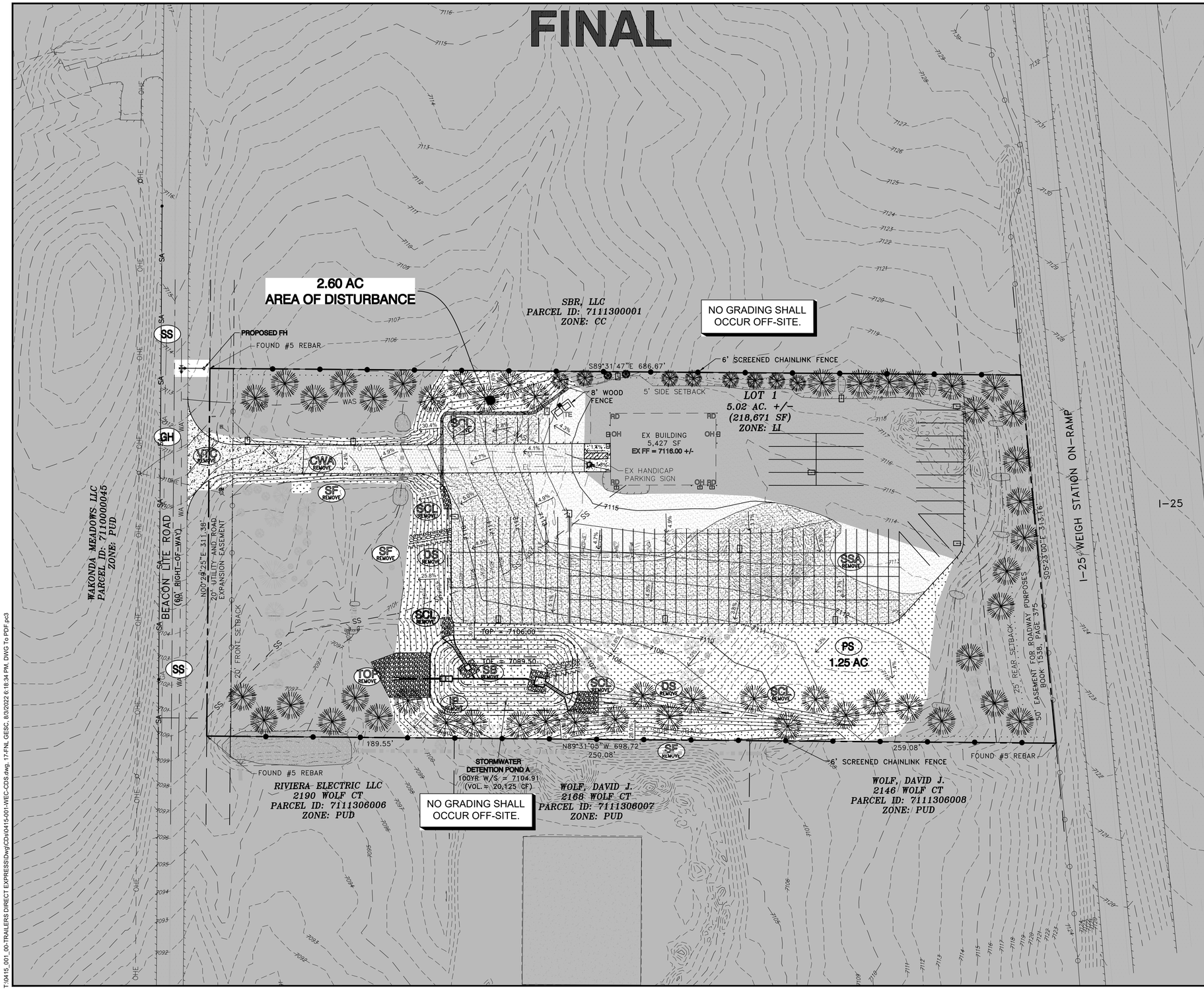

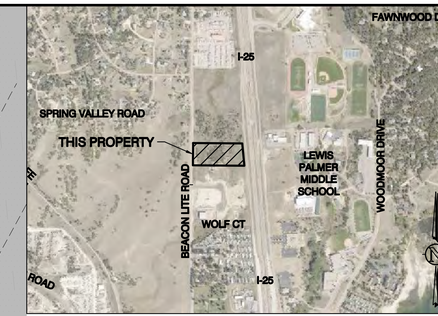

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Concrete Washout Area (CWA) MM-1

Description

Photograph CWA-1. Example of concrete washout area. Note gravel tracking pad for access and sign.

Concrete waste management involves designating and properly managing a specific area of the construction site as a concrete washout area. A concrete washout area can be created using one of several approaches designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. Three basic approaches are available: excavation of a pit in the ground, use of an above ground storage area, or use of prefabricated haul-away concrete washout containers. Surface discharges of concrete washout water from construction sites are prohibited.

Appropriate Uses

Concrete washout areas must be designated on all sites that will generate concrete wash water or liquid concrete waste from onsite concrete mixing or concrete delivery.

Because pH is a pollutant of concern for washout activities, when unlined pits are used for concrete washout, the soil must have adequate buffering capacity to result in protection of state groundwater standards; otherwise, a liner/containment must be used. The following management practices are recommended to prevent an impact from unlined pits to groundwater:

- The use of the washout site should be temporary (less than 1 year), and
- The washout site should be not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.

Design and Installation

Concrete washout activities must be conducted in a manner that does not contribute pollutants to surface waters or stormwater runoff. Concrete washout areas may be lined or unlined excavated pits in the ground, commercially manufactured prefabricated washout containers, or aboveground holding areas constructed of berms, sandbags or straw bales with a plastic liner.

Although unlined washout areas may be used, lined pits may be required to protect groundwater under certain conditions.

Do not locate an unlined washout area within 400 feet of any natural drainage pathway or waterbody or within 1,000 feet of any wells or drinking water sources. Even for lined concrete washouts, it is advisable to locate the facility away from waterbodies and drainage paths. If site constraints make these

Concrete Washout Area	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

setbacks infeasible or if highly permeable soils exist in the area, then the pit must be installed with an impermeable liner (16 mil minimum thickness) or surface storage alternatives using prefabricated concrete washout devices or a lined aboveground storage area should be used.

Design details with notes are provided in Detail CWA-1 for pits and CWA-2 for aboveground storage areas. Pre-fabricated concrete washout container information can be obtained from vendors.

Maintenance and Removal

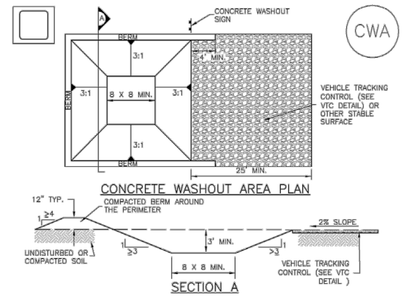
A key consideration for concrete washout areas is to ensure that adequate signage is in place identifying the location of the washout area. Part of inspecting and maintaining washout areas is ensuring that adequate signage is provided and in good repair and that the washout area is being used, as opposed to washout in non-designated areas of the site.

Remove concrete waste in the washout area, as needed to maintain BMP function (typically when filled to about two-thirds of its capacity). Collect concrete waste and deliver offsite to a designated disposal location.

Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste. If the wash water is allowed to evaporate and the concrete hardens, it may be recycled.

Photograph CWA-2. Prefabricated concrete washout. Photo courtesy of CDOT.

Photograph CWA-3. Earthen concrete washout. Photo courtesy of CDOT.



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.

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.

Stabilized Staging Area (SSA) SM-6

Description

Photograph SSA-1. Example of a staging area with a gravel surface to prevent mud tracking and reduce runoff. Photo courtesy of Douglas County.

A stabilized staging area is a clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored. The contractor office trailer may also be located in this area. Depending on the size of the construction site, more than one staging area may be necessary.

Appropriate Uses

Most construction sites will require a staging area, which should be clearly designated in SWMP drawings. The layout of the staging area may vary depending on the type of construction activity. Staging areas located in roadways due to space constraints require special measures to avoid materials being washed into storm inlets.

Design and Installation

Stabilized staging areas should be completed prior to other construction activities beginning on the site. Major components of a stabilized staging area include:

- Appropriate space to contain storage and provide for loading/unloading operations, as well as parking if necessary.
- A stabilized surface, either paved or covered, with 3-inch diameter aggregate or larger.
- Perimeter controls such as silt fence, sediment control logs, or other measures.
- Construction fencing to prevent unauthorized access to construction materials.
- Provisions for Good Housekeeping practices related to materials storage and disposal, as described in the Good Housekeeping BMP Fact Sheet.
- A stabilized construction entrance/exit, as described in the Vehicle Tracking Control BMP Fact Sheet, to accommodate traffic associated with material delivery and waste disposal vehicles.

Over-sizing the stabilized staging area may result in disturbance of existing vegetation in excess of that required for the project. This increases costs, as well as requirements for long-term stabilization following the construction period. When designing the stabilized staging area, minimize the area of disturbance to the extent practical.

Stabilized Staging Area	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material	Yes

Minimizing Long-Term Stabilization Requirements

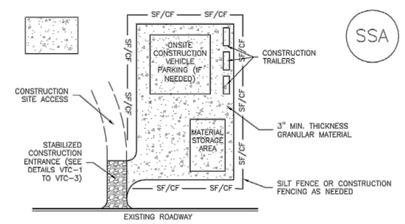
- Utilize off-site parking and restrict vehicle access to the site.
- Use construction mats in lieu of rock when staging is provided in an area that will not be disturbed otherwise.
- Consider use of a bermed contained area for materials and equipment that do not require a stabilized surface.
- Consider phasing of staging areas to avoid disturbance in an area that will not be otherwise disturbed.

See Detail SSA-1 for a typical stabilized staging area and SSA-2 for a stabilized staging area when materials staging in roadways is required.

Maintenance and Removal

Maintenance of stabilized staging areas includes maintaining a stable surface cover of gravel, repairing perimeter controls, and following good housekeeping practices.

When construction is complete, debris, unused stockpiles and materials should be recycled or properly disposed. In some cases, this will require disposal of contaminated soil from equipment leaks in an appropriate landfill. Staging areas should then be permanently stabilized with vegetation or other surface cover planned for the development.



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.

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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CHECKED BY: CFC
PROJECT NO. 01-0415.001.00
DOC CON # 0018-GESC DTL
SHEET 18 OF 29

Construction Fence (CF) SM-3

Description

Photograph CF-1. A construction fence helps delineate areas where existing vegetation is being protected. Photo courtesy of Douglas County.

A construction fence restricts site access to designated entrances and exits, delineates construction site boundaries, and keeps construction out of sensitive areas such as natural areas to be preserved as open space, wetlands and riparian areas.

Appropriate Uses

A construction fence can be used to delineate the site perimeter and locations within the site where access is restricted to protect natural resources such as wetlands, waterbodies, trees, and other natural areas of the site that should not be disturbed.

If natural resource protection is an objective, then the construction fencing should be used in combination with other perimeter control BMPs such as silt fence, sediment control logs or similar measures.

Design and Installation

Construction fencing may be chain link or plastic mesh and should be installed following manufacturer's recommendations. See Detail CF-1 for typical installations.

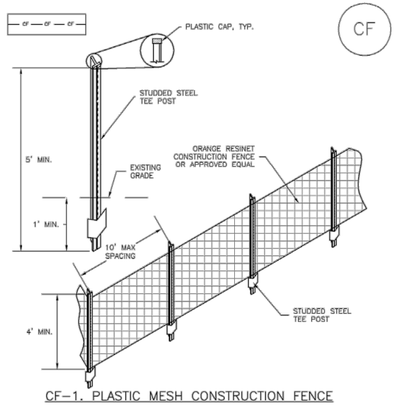
Do not place construction fencing in areas within work limits of machinery.

Maintenance and Removal

- Inspect fences for damage; repair or replace as necessary.
- Fencing should be tight and any areas with slumping or fallen posts should be reinstalled.
- Fencing should be removed once construction is complete.

Construction Fence	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

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.

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)

Silt Fence (SF) SC-1

Description

Photograph SF-1. Silt fence creates a sediment barrier, forcing sheet flow runoff to evaporate or infiltrate.

A silt fence is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is designed as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Appropriate Uses

A silt fence can be used where runoff is conveyed from a disturbed area as sheet flow. Silt fence is not designed to receive concentrated flow or to be used as a filter fabric. Typical uses include:

- Down slope of a disturbed area to accept sheet flow.
- Along the perimeter of a receiving water such as a stream, pond or wetland.
- At the perimeter of a construction site.

Design and Installation

Silt fence should be installed along the contour of slopes so that it intercepts sheet flow. The maximum recommended tributary drainage area per 100 lineal feet of silt fence, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to silt fence installed along the contour. Silt fence installed for other uses, such as perimeter control, should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the silt fence.

See Detail SF-1 for proper silt fence installation, which involves proper trenching, staking, securing the fabric to the stakes, and backfilling the silt fence. Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and the fabric.

Silt fence must meet the minimum allowable strength requirements, depth of installation requirement, and other specifications in the design details. Improper installation of silt fence is a common reason for silt fence failure; however, when properly installed and used for the appropriate purposes, it can be highly effective.

Silt Fence	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

SC-1 Silt Fence (SF)

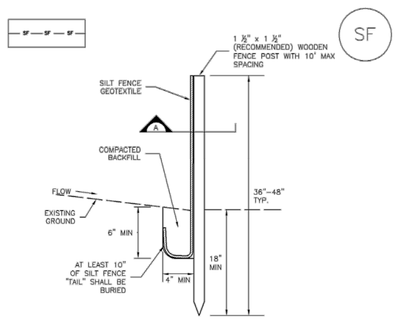
Maintenance and Removal

Photograph SF-2. When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to the silt fence. Photo courtesy of Tom Gore.

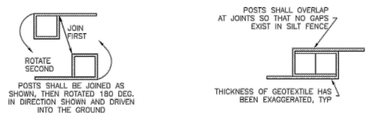
Inspection of silt fence includes observing the material for tears or holes and checking for slumping fence and undercut areas bypassing flows. Repair of silt fence typically involves replacing the damaged section with a new section. Sediment accumulated behind silt fence should be removed, as needed to maintain BMP effectiveness, typically before it reaches a depth of 6 inches.

Silt fence may be removed when the upstream area has reached final stabilization.

Silt Fence (SF) SC-1



SILT FENCE



SECTION A

SF-1. SILT FENCE

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.

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SHEET 19 OF 29

- **Inflow Structure**: For concentrated flow entering the basin, provide energy dissipation at the point of inflow.

Table SB-1. Additional Volume Requirements for Undisturbed and Developed Tributary Areas Draining through Sediment Basins

Imperviousness (%)	Additional Storage Volume (ft^3) Per Acre of Tributary Area
Undeveloped	500
10	800
20	1230
30	1600
40	2030
50	2470
60	2980
70	3560
80	4360
90	5300
100	6460

- **Outlet Works**: The outlet pipe shall extend through the embankment at a minimum slope of 0.5 percent. Outlet works can be designed using one of the following approaches:
  - **Riser Pipe (Simplified Detail):** Detail SB-1 provides a simplified design for basins treating no more than 15 acres.
  - **Orifice Plate or Riser Pipe**: Follow the design criteria for Full Spectrum Detention outlets in the EDB Fact Sheet provided in Chapter 4 of this manual for sizing of outlet perforations with an emptying time of approximately 72 hours. In lieu of the trash rack, pack uniformly sized 1½ - to 2-inch gravel in front of the plate or surrounding the riser pipe. This gravel will need to be cleaned out frequently during the construction period as sediment accumulates within it. The gravel pack will need to be removed and disposed of following construction to reclaim the basin for use as a permanent detention facility. If the basin will be used as a permanent extended detention basin for the site, a trash rack will need to be installed once contributing drainage areas have been stabilized and the gravel pack and accumulated sediment have been removed.
  - **Floating Skimmer**: If a floating skimmer is used, install it using manufacturer's recommendations. Illustration SB-1 provides an illustration of a Faircloth Skimmer Floating Outlet™, one of the more commonly used floating skimmer outlets. A skimmer should be designed to release the design volume in no less than 48 hours. The use of a floating skimmer outlet can increase the sediment capture efficiency of a basin significantly. A floating outlet continually decants cleanest water off the surface of the pond and releases cleaner water than would discharge from a perforated riser pipe or plate.

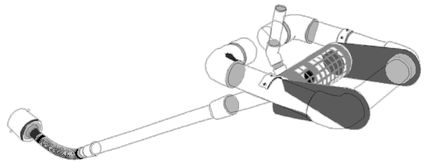


Illustration SB-1. Outlet structure for a temporary sediment basin - Faircloth Skimmer Floating Outlet. Illustration courtesy of J. W. Faircloth & Sons, Inc., FairclothSkimmer.com.

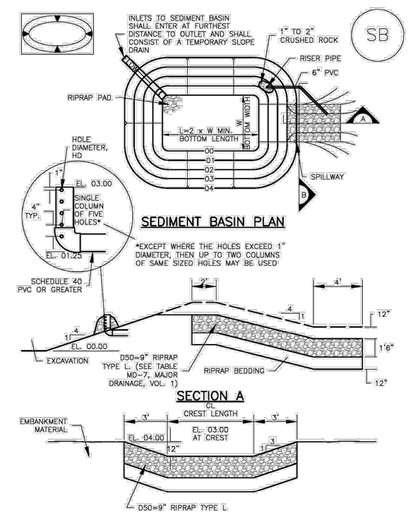
- **Outlet Protection and Spillway:** Consider all flow paths for runoff leaving the basin, including protection at the typical point of discharge as well as overtopping.
  - **Outlet Protection:** Outlet protection should be provided where the velocity of flow will exceed the maximum permissible velocity of the material of the waterway into which discharge occurs. This may require the use of a riprap apron at the outlet location and/or other measures to keep the waterway from eroding.
  - **Emergency Spillway:** Provide a stabilized emergency overflow spillway for rainstorms that exceed the capacity of the sediment basin volume and its outlet. Protect basin embankments from erosion and overtopping. If the sediment basin will be converted to a permanent detention basin, design and construct the emergency spillway(s) as required for the permanent facility. If the sediment basin will not become a permanent detention basin, it may be possible to substitute a heavy polyvinyl membrane or properly bedded rock cover to line the spillway and downstream embankment, depending on the height, slope, and width of the embankments.

Maintenance and Removal

Maintenance activities include the following:

- Dredge sediment from the basin, as needed to maintain BMP effectiveness, typically when the design storage volume is no more than one-third filled with sediment.
- Inspect the sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris. Remove, clean and replace the gravel around the outlet on a regular basis to remove the accumulated sediment within it and keep the outlet functioning.
- Be aware that removal of a sediment basin may require dewatering and associated permit requirements.
- Do not remove a sediment basin until the upstream area has been stabilized with vegetation.

Final disposition of the sediment basin depends on whether the basin will be converted to a permanent post-construction stormwater basin or whether the basin area will be returned to grade. For basins being converted to permanent detention basins, remove accumulated sediment and reconfigure the basin and outlet to meet the requirements of the final design for the detention facility. If the sediment basin is not to be used as a permanent detention facility, fill the excavated area with soil and stabilize with vegetation.



Description

Photograph SB-1. Sediment basin at the toe of a slope. Photo courtesy of WWE.

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.

Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

Design and Installation

The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume**: Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent "clean" runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft^3/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft^3/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.
- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.
- **Dam Embankment**: It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

TABLE SB-1. SIZING INFORMATION FOR STANDARD SEDIMENT BASIN

Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
1	12 ½	2	9/32
2	21	3	13/64
3	28	5	½
4	33 ½	6	9/16
5	38 ½	8	25/32
6	43	9	29/32
7	47 ¼	11	29/32
8	51	12	29/32
9	55	13	15/16
10	58 ¼	15	15/16
11	61	16	31/32
12	64	18	1
13	67 ½	19	1 1/64
14	70 ½	21	1 ⅛
15	73 ¼	22	1 3/16

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF SEDIMENT BASIN.
   - TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   - FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.
   - FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.
2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY THAT RELIES ON ON BMSINS AS AS A STORMWATER CONTROL.
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 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.
5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
6. PIPE SCH 40 OR GREATER SHALL BE USED.
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 LARGER THAN 15 ACRES.

SEDIMENT BASIN 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 IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).
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 LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

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

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CHECKED BY: CFC
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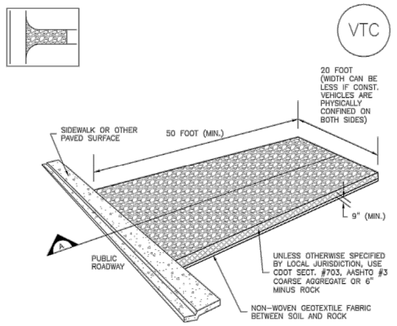
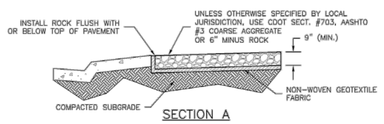
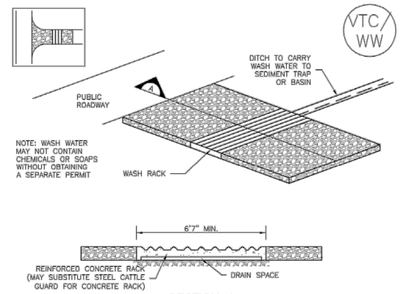
DOC CON # 0020-GESC DTL
SHEET 20 OF 29

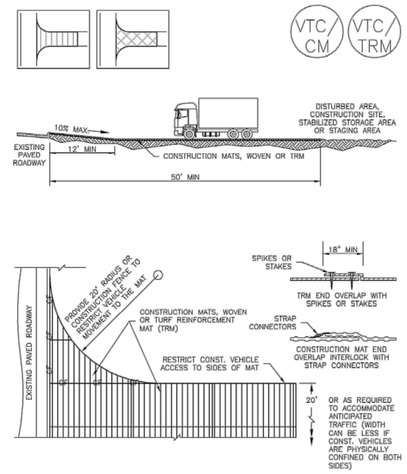




VTC–1. AGGREGATE VEHICLE TRACKING CONTROL



VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

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.

4. 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)

Description

Photograph VTC-1. A vehicle tracking control pad constructed with properly sized rock reduces off-site sediment tracking.

Vehicle tracking controls provide stabilized construction site access where vehicles exit the site onto paved public roads. An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface.

Appropriate Uses

Implement a stabilized construction entrance or vehicle tracking control where frequent heavy vehicle traffic exits the construction site onto a paved roadway. An effective vehicle tracking control is particularly important during the following conditions:

- Wet weather periods when mud is easily tracked off site.
- During dry weather periods where dust is a concern.
- When poorly drained, clayey soils are present on site.

Although wheel washes are not required in designs of vehicle tracking controls, they may be needed at particularly muddy sites.

Design and Installation

Construct the vehicle tracking control on a level surface. Where feasible, grade the tracking control towards the construction site to reduce off-site runoff. Place signage, as needed, to direct construction vehicles to the designated exit through the vehicle tracking control. There are several different types of stabilized construction entrances including:

VTC-1. Aggregate Vehicle Tracking Control. This is a coarse-aggregate surfaced pad underlain by a geotextile. This is the most common vehicle tracking control, and when properly maintained can be effective at removing sediment from vehicle tires.

VTC-2. Vehicle Tracking Control with Construction Mat or Turf Reinforcement Mat. This type of control may be appropriate for site access at very small construction sites with low traffic volume over vegetated areas. Although this application does not typically remove sediment from vehicles, it helps protect existing vegetation and provides a stabilized entrance.

Vehicle Tracking Control	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

VTC-3. Stabilized Construction Entrance/Exit with Wheel Wash. This is an aggregate pad, similar to VTC-1, but includes equipment for tire washing. The wheel wash equipment may be as simple as hand-held power washing equipment to more advance proprietary systems. When a wheel wash is provided, it is important to direct wash water to a sediment trap prior to discharge from the site.

Vehicle tracking controls are sometimes installed in combination with a sediment trap to treat runoff.

Maintenance and Removal

Photograph VTC-2. A vehicle tracking control pad with wheel wash facility. Photo courtesy of Tom Gore.

Inspect the area for degradation and replace aggregate or material used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary.

With aggregate vehicle tracking controls, ensure rock and debris from this area do not enter the public right-of-way.

Remove sediment that is tracked onto the public right of way daily or more frequently as needed. Excess sediment in the roadway indicates that the stabilized construction entrance needs maintenance.

Ensure that drainage ditches at the entrance/exit area remain clear.

A stabilized entrance should be removed only when there is no longer the potential for vehicle tracking to occur. This is typically after the site has been stabilized.

When wheel wash equipment is used, be sure that the wash water is discharged to a sediment trap prior to discharge. Also inspect channels conveying the water from the wash area to the sediment trap and stabilize areas that may be eroding.

When a construction entrance/exit is removed, excess sediment from the aggregate should be removed and disposed of appropriately. The entrance should be promptly stabilized with a permanent surface following removal, typically by paving.

Description

Photograph TOP-1. Riprap outlet protection.

Outlet protection helps to reduce erosion immediately downstream of a pipe, culvert, slope drain, rundown or other conveyance with concentrated, high-velocity flows. Typical outlet protection consists of riprap or rock aprons at the conveyance outlet.

Appropriate Uses

Outlet protection should be used when a conveyance discharges onto a disturbed area where there is potential for accelerated erosion due to concentrated flow. Outlet protection should be provided where the velocity at the culvert outlet exceeds the maximum permissible velocity of the material in the receiving channel.

Note**:** This Fact Sheet and detail are for temporary outlet protection, outlets that are intended to be used for less than 2 years. For permanent, long-term outlet protection, see the *Major Drainage* chapter of Volume 1.

Design and Installation

Design outlet protection to handle runoff from the largest drainage area that may be contributing runoff during construction (the drainage area may change as a result of grading). Key in rock, around the entire perimeter of the apron, to a minimum depth of 6 inches for stability. Extend riprap to the height of the culvert or the normal flow depth of the downstream channel, whichever is less. Additional erosion control measures such as vegetative lining, turf reinforcement mat and/or other channel lining methods may be required downstream of the outlet protection if the channel is susceptible to erosion. See Design Detail OP-1 for additional information.

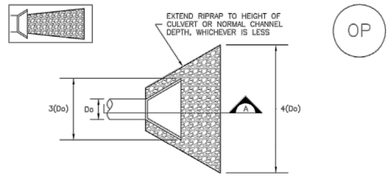
Maintenance and Removal

Inspect apron for damage and displaced rocks. If rocks are missing or significantly displaced, repair or replace as necessary. If rocks are continuously missing or displaced, consider increasing the size of the riprap or deeper keying of the perimeter.

Remove sediment accumulated at the outlet before the outlet protection becomes buried and ineffective. When sediment accumulation is noted, check that upgradient BMPs, including inlet protection, are in effective operating condition.

Outlet protection may be removed once the pipe is no longer draining an upstream area, or once the downstream area has been sufficiently stabilized. If the drainage pipe is permanent, outlet protection can be left in place; however, permanent outlet protection should be designed and constructed in accordance with the requirements of the *Major Drainage* chapter of Volume 2.

Outlet Protection	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No



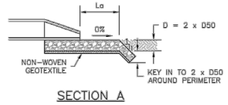


TABLE OP–1. TEMPORARY OUTLET PROTECTION SIZING TABLE

PIPE DIAMETER, Do (INCHES)	DISCHARGE, Q (CFS)	APRON LENGTH, La (FT)	RIPRAP D50 DIAMETER MIN (INCHES)
8	2.5 5	5 10	4 6
12	5 10	10 13	4 6
18	10 20 30 40	10 16 23 26	6 9 12 16
24	30 40 50 60	16 26 26 30	9 9 12 16

OP–1. TEMPORARY OUTLET PROTECTION

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DOC CON # 0021-GESC DTL
SHEET 21 OF 29

Temporary Outlet Protection (TOP) EC-8

TEMPORARY OUTLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   - LOCATION OF OUTLET PROTECTION.
   - DIMENSIONS OF OUTLET PROTECTION.

2. DETAIL IS INTENDED FOR PIPES WITH SLOPE ≤ 10%. ADDITIONAL EVALUATION OF RIPRAP SIZING AND OUTLET PROTECTION DIMENSIONS REQUIRED FOR STEEPER SLOPES.

3. TEMPORARY OUTLET PROTECTION INFORMATION IS FOR OUTLETS INTENDED TO BE UTILIZED LESS THAN 2 YEARS.

TEMPORARY OUTLET PROTECTION INSPECTION AND 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.

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 AND PREVIOUS VERSION OF VOLUME 3, NOT AVAILABLE IN AUTOCAD)

Sediment Control Log (SCL) SC-2

Description

Photographs SCL-1 and SCL-2. Sediment control logs used as 1) a perimeter control around a soil stockpile; and, 2) as a "J-hook" perimeter control at the corner of a construction site.

A sediment control log is a linear roll made of natural materials such as straw, coconut fiber, or compost. The most common type of sediment control log has straw filling and is often referred to as a "straw wattle." All sediment control logs are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Appropriate Uses

Sediment control logs can be used in the following applications to trap sediment:

- As perimeter control for stockpiles and the site.
- As part of inlet protection designs.
- As check dams in small drainage ditches. (Sediment control logs are not intended for use in channels with high flow velocities.)
- On disturbed slopes to shorten flow lengths (as an erosion control).
- As part of multi-layered perimeter control along a receiving water such as a stream, pond or wetland.

Sediment control logs work well in combination with other layers of erosion and sediment controls.

Design and Installation

Sediment control logs should be installed along the contour to avoid concentrating flows. The maximum allowable tributary drainage area per 100 lineal feet of sediment control log, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to sediment control logs installed along the contour. When installed for other uses, such as perimeter control, it should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the BMP.

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

SC-2 Sediment Control Log (SCL)

Although sediment control logs initially allow runoff to flow through the BMP, they can quickly become a barrier and should be installed as if they are impermeable.

Design details and notes for sediment control logs are provided in the following details. Sediment logs must be properly installed per the detail to prevent undercutting, bypassing and displacement. When installed on slopes, sediment control logs should be installed along the contours (i.e., perpendicular to flow).

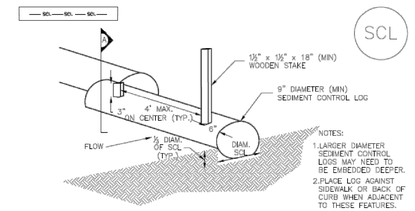
Improper installation can lead to poor performance. Be sure that sediment control logs are properly trenched (if lighter than 8 lb/foot), anchored and tightly jointed.

Maintenance and Removal

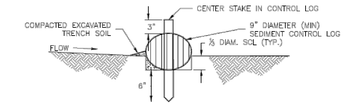
Be aware that sediment control logs will eventually degrade. Remove accumulated sediment before the depth is one-half the height of the sediment log and repair damage to the sediment log, typically by replacing the damaged section.

Once the upstream area is stabilized, remove and properly dispose of the logs. Areas disturbed beneath the logs may need to be seeded and mulched. Sediment control logs that are biodegradable may occasionally be left in place (e.g., when logs are used in conjunction with erosion control blankets as permanent slope breaks). However, removal of sediment control logs after final stabilization is typically appropriate when used in perimeter control, inlet protection and check dam applications. Compost from compost sediment control logs may be spread over the area and seeded as long as this does not cover newly established vegetation.

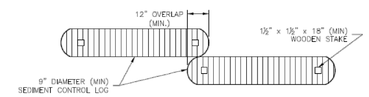
Sediment Control Log (SCL) SC-2



TRENCHED SEDIMENT CONTROL LOG



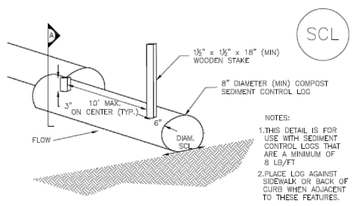
SECTION Ⓐ
TRENCHED SEDIMENT CONTROL LOG



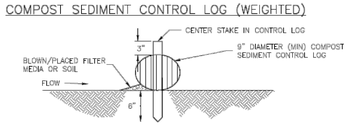
LOG JOINTS

SCL-1. TRENCHED SEDIMENT CONTROL LOG

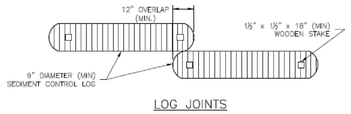
SC-2 Sediment Control Log (SCL)



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



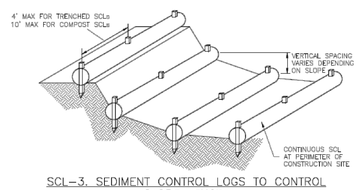
SECTION Ⓐ
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL-2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

Sediment Control Log (SCL) SC-2



SCL-3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

SC-2 Sediment Control Log (SCL)

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

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

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

4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

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

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

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DOC CON # 0022-GESC DTL
SHEET 22 OF 29

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Description

Photograph IP-1. Inlet protection for a curb opening inlet.

Inlet protection consists of permeable barriers installed around an inlet to filter runoff and remove sediment prior to entering a storm drain inlet. Inlet protection can be constructed from rock socks, sediment control logs, silt fence, block and rock socks, or other materials approved by the local jurisdiction. Area inlets can also be protected by over-excavating around the inlet to form a sediment trap.

Appropriate Uses

Install protection at storm sewer inlets that are operable during construction. Consider the potential for tracked-out sediment or temporary stockpile areas to contribute sediment to inlets when determining which inlets must be protected. This may include inlets in the general proximity of the construction area, not limited to downgradient inlets. Inlet protection is not a stand-alone BMP and should be used in conjunction with other upgradient BMPs.

Design and Installation

To function effectively, inlet protection measures must be installed to ensure that flows do not bypass the inlet protection and enter the storm drain without treatment. However, designs must also enable the inlet to function without completely blocking flows into the inlet in a manner that causes localized flooding. When selecting the type of inlet protection, consider factors such as type of inlet (e.g., curb or area, sump or on-grade conditions), traffic, anticipated flows, ability to secure the BMP properly, safety and other site-specific conditions. For example, block and rock socks will be better suited to a curb and gutter along a roadway, as opposed to silt fence or sediment control logs, which cannot be properly secured in a curb and gutter setting, but are effective area inlet protection measures.

Several inlet protection designs are provided in the Design Details. Additionally, a variety of proprietary products are available for inlet protection that may be approved for use by local governments. If proprietary products are used, design details and installation procedures from the manufacturer must be followed. Regardless of the type of inlet protection selected, inlet protection is most effective when combined with other BMPs such as curb socks and check dams. Inlet protection is often the last barrier before runoff enters the storm sewer or receiving water.

Design details with notes are provided for these forms of inlet protection:

IP-1. Block and Rock Sock Inlet Protection for Sump or On-grade Inlets

IP-2. Curb (Rock) Socks Upstream of Inlet Protection, On-grade Inlets

Inlet Protection (various forms)	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

IP-3. Rock Sock Inlet Protection for Sump/Area Inlet

IP-4. Silt Fence Inlet Protection for Sump/Area Inlet

IP-5. Over-excavation Inlet Protection

IP-6. Straw Bale Inlet Protection for Sump/Area Inlet

CIP-1. Culvert Inlet Protection

Propriety inlet protection devices should be installed in accordance with manufacturer specifications.

More information is provided below on selecting inlet protection for sump and on-grade locations.

Inlets Located in a Sump

When applying inlet protection in sump conditions, it is important that the inlet continue to function during larger runoff events. For curb inlets, the maximum height of the protective barrier should be lower than the top of the curb opening to allow overflow into the inlet during larger storms without excessive localized flooding. If the inlet protection height is greater than the curb elevation, particularly if the filter becomes clogged with sediment, runoff will not enter the inlet and may bypass it, possibly causing localized flooding, public safety issues, and downstream erosion and damage from bypassed flows.

Area inlets located in a sump setting can be protected through the use of silt fence, concrete block and rock socks (on paved surfaces), sediment control logs/straw wattles embedded in the adjacent soil and stacked around the area inlet (on pervious surfaces), over-excavation around the inlet, and proprietary products providing equivalent functions.

Inlets Located on a Slope

For curb and gutter inlets on paved sloping streets, block and rock sock inlet protection is recommended in conjunction with curb socks in the gutter leading to the inlet. For inlets located along unpaved roads, also see the Check Dam Fact Sheet.

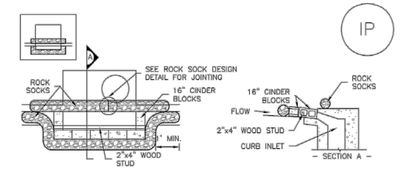
Maintenance and Removal

Inspect inlet protection frequently. Inspection and maintenance guidance includes:

- Inspect for tears that can result in sediment directly entering the inlet, as well as result in the contents of the BMP (e.g., gravel) washing into the inlet.
- Check for improper installation resulting in untreated flows bypassing the BMP and directly entering the inlet or bypassing to an unprotected downstream inlet. For example, silt fence that has not been properly trenched around the inlet can result in flows under the silt fence and directly into the inlet.
- Look for displaced BMPs that are no longer protecting the inlet. Displacement may occur following larger storm events that wash away or reposition the inlet protection. Traffic or equipment may also crush or displace the BMP.
- Monitor sediment accumulation upgradient of the inlet protection.

- Remove sediment accumulation from the area upstream of the inlet protection, as needed to maintain BMP effectiveness, typically when it reaches no more than half the storage capacity of the inlet protection. For silt fence, remove sediment when it accumulates to a depth of no more than 6 inches. Remove sediment accumulation from the area upstream of the inlet protection as needed to maintain the functionality of the BMP.
- Propriety inlet protection devices should be inspected and maintained in accordance with manufacturer specifications. If proprietary inlet insert devices are used, sediment should be removed in a timely manner to prevent devices from breaking and spilling sediment into the storm drain.

Inlet protection must be removed and properly disposed of when the drainage area for the inlet has reached final stabilization.



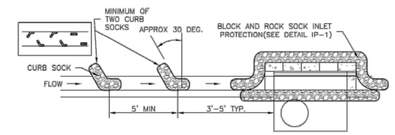
IP–1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

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

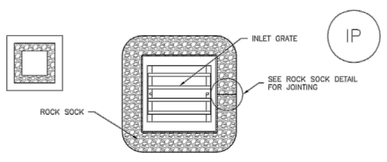
CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

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.

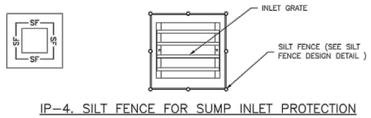
4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON–GRADE INLETS.



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.



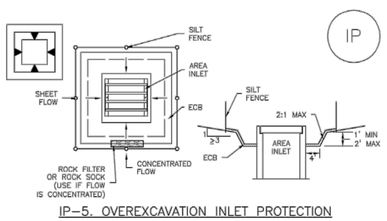
IP–4. SILT FENCE FOR SUMP INLET PROTECTION

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.



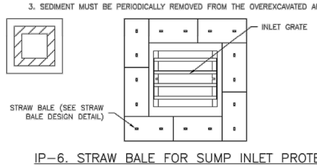
IP–5. OVEREXCAVATION INLET PROTECTION

OVEREXCAVATION INLET PROTECTION INSTALLATION NOTES

1. THIS FORM OF INLET PROTECTION IS PRIMARILY APPLICABLE FOR SITES THAT HAVE NOT YET REACHED FINAL GRADE AND SHOULD BE USED ONLY FOR INLETS WITH A RELATIVELY SMALL CONTRIBUTING DRAINAGE AREA.

2. WHEN USING FOR CONCENTRATED FLOWS, SHAPE BASIN IN 2:1 RATIO WITH LENGTH ORIENTED TOWARDS DIRECTION OF FLOW.

3. SEDIMENT MUST BE PERIODICALLY REMOVED FROM THE OVEREXCAVATED AREA.

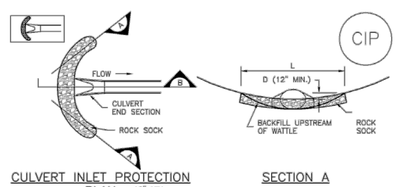


IP–6. STRAW BALE FOR SUMP INLET PROTECTION

STRAW BALE BARRIER INLET PROTECTION INSTALLATION NOTES

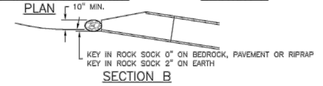
1. SEE STRAW BALE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER.



CULVERT INLET PROTECTION PLAN

SECTION A



SECTION B

CIP–1. CULVERT INLET PROTECTION

CULVERT INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
–LOCATION OF CULVERT INLET PROTECTION.

2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINTING DETAIL.

CULVERT 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 THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS ½ THE HEIGHT OF THE ROCK SOCK.

5. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM 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.

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 ½ 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.

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Rock Sock (RS) SC-5

Description

Photograph RS-1. Rock socks placed at regular intervals in a curb line can help reduce sediment loading to storm sewer inlets. Rock socks can also be used as perimeter controls.

A rock sock is constructed of gravel that has been wrapped by wire mesh or a geotextile to form an elongated cylindrical filter. Rock socks are typically used either as a perimeter control or as part of inlet protection. When placed at angles in the curb line, rock socks are typically referred to as curb socks. Rock socks are intended to trap sediment from stormwater runoff that flows onto roadways as a result of construction activities.

Appropriate Uses

Rock socks can be used at the perimeter of a disturbed area to control localized sediment loading. A benefit of rock socks as opposed to other perimeter controls is that they do not have to be trenched or staked into the ground; therefore, they are often used on roadway construction projects where paved surfaces are present.

Use rock socks in inlet protection applications when the construction of a roadway is substantially complete and the roadway has been directly connected to a receiving storm system.

Design and Installation

When rock socks are used as perimeter controls, the maximum recommended tributary drainage area per 100 lineal feet of rock socks is approximately 0.25 acres with disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. A rock sock design detail and notes are provided in Detail RS-1. Also see the Inlet Protection Fact Sheet for design and installation guidance when rock socks are used for inlet protection and in the curb line.

When placed in the gutter adjacent to a curb, rock socks should protrude no more than two feet from the curb in order for traffic to pass safely. If located in a high traffic area, place construction markers to alert drivers and street maintenance workers of their presence.

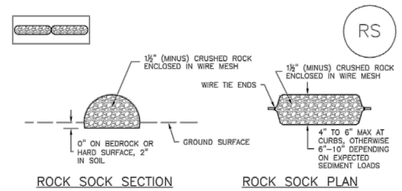
Maintenance and Removal

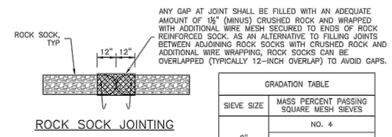
Rock socks are susceptible to displacement and breaking due to vehicle traffic. Inspect rock socks for damage and repair or replace as necessary. Remove sediment by sweeping or vacuuming as needed to maintain the functionality of the BMP, typically when sediment has accumulated behind the rock sock to one-half of the sock's height.

Once upstream stabilization is complete, rock socks and accumulated sediment should be removed and properly disposed.

Rock Sock	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

SC-5 Rock Sock (RS)





ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1½" (MINUS) CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED SOCK. AS AN ALTERNATIVE TO FILLING JOINTS BETWEEN ADJOINING ROCK SOCKS WITH CRUSHED ROCK AND ADDITIONAL WIRE WRAPPING, ROCK SOCKS CAN BE OVERLAPPED (TYPICALLY 12–INCH OVERLAP) TO AVOID GAPS.

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

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.

Good Housekeeping Practices (GH) MM-3

Description

Photographs GH-1 and GH-2. Proper materials storage and secondary containment for fuel tanks are important good housekeeping practices. Photos courtesy of CDOT and City of Aurora.

Implement construction site good housekeeping practices to prevent pollution associated with solid, liquid and hazardous construction-related materials and wastes. Stormwater Management Plans (SWMPs) should clearly specify BMPs including these good housekeeping practices:

- Provide for waste management.
- Establish proper building material staging areas.
- Designate paint and concrete washout areas.
- Establish proper equipment/vehicle fueling and maintenance practices.
- Control equipment/vehicle washing and allowable non-stormwater discharges.
- Develop a spill prevention and response plan.

Acknowledgement: This Fact Sheet is based directly on EPA guidance provided in *Developing Your Stormwater Pollution Prevent Plan* (EPA 2007).

Appropriate Uses

Good housekeeping practices are necessary at all construction sites.

Design and Installation

The following principles and actions should be addressed in SWMPs:

- **Provide for Waste Management.** Implement management procedures and practices to prevent or reduce the exposure and transport of pollutants in stormwater from solid, liquid and sanitary wastes that will be generated at the site. Practices such as trash disposal, recycling, proper material handling, and cleanup measures can reduce the potential for stormwater runoff to pick up construction site wastes and discharge them to surface waters. Implement a comprehensive set of waste-management practices for hazardous or toxic materials, such as paints, solvents, petroleum products, pesticides, wood preservatives, acids, roofing tar, and other materials. Practices should include storage, handling, inventory, and cleanup procedures, in case of spills. Specific practices that should be considered include:

Solid or Construction Waste

- Designate trash and bulk waste-collection areas on-site.

Good Housekeeping	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

MM-3 Good Housekeeping Practices (GH)

- Recycle materials whenever possible (e.g., paper, wood, concrete, oil).
- Segregate and provide proper disposal options for hazardous material wastes.
- Clean up litter and debris from the construction site daily.
- Locate waste-collection areas away from streets, gutters, watercourses, and storm drains. Waste-collection areas (dumpsters, and such) are often best located near construction site entrances to minimize traffic on disturbed soils. Consider secondary containment around waste collection areas to minimize the likelihood of contaminated discharges.
- Empty waste containers before they are full and overflowing.

Sanitary and Septic Waste

- Provide convenient, well-maintained, and properly located toilet facilities on-site.
- Locate toilet facilities away from storm drain inlets and waterways to prevent accidental spills and contamination of stormwater.
- Maintain clean restroom facilities and empty portable toilets regularly.
- Where possible, provide secondary containment pans under portable toilets.
- Provide tie-downs or stake-downs for portable toilets.
- Educate employees, subcontractors, and suppliers on locations of facilities.
- Treat or dispose of sanitary and septic waste in accordance with state or local regulations. Do not discharge or bury wastewater at the construction site.
- Inspect facilities for leaks. If found, repair or replace immediately.
- Special care is necessary during maintenance (pump out) to ensure that waste and/or biocide are not spilled on the ground.

Hazardous Materials and Wastes

- Develop and implement employee and subcontractor education, as needed, on hazardous and toxic waste handling, storage, disposal, and cleanup.
- Designate hazardous waste-collection areas on-site.
- Place all hazardous and toxic material wastes in secondary containment.

Photograph GH-3. Locate portable toilet facilities on level surfaces away from waterways and storm drains. Photo courtesy of WWE.

Good Housekeeping Practices (GH) MM-3

- Hazardous waste containers should be inspected to ensure that all containers are labeled properly and that no leaks are present.

- **Establish Proper Building Material Handling and Staging Areas**. The SWMP should include comprehensive handling and management procedures for building materials, especially those that are hazardous or toxic. Paints, solvents, pesticides, fuels and oils, other hazardous materials or building materials that have the potential to contaminate stormwater should be stored indoors or under cover whenever possible or in areas with secondary containment. Secondary containment measures prevent a spill from spreading across the site and may include dikes, berms, curbing, or other containment methods. Secondary containment techniques should also ensure the protection of groundwater. Designate staging areas for activities such as fueling vehicles, mixing paints, plaster, mortar, and other potential pollutants. Designated staging areas enable easier monitoring of the use of materials and clean up of spills. Training employees and subcontractors is essential to the success of this pollution prevention principle. Consider the following specific materials handling and staging practices:
  - Train employees and subcontractors in proper handling and storage practices.
  - Clearly designate site areas for staging and storage with signs and on construction drawings. Staging areas should be located in areas central to the construction site. Segment the staging area into sub-areas designated for vehicles, equipment, or stockpiles. Construction entrances and exits should be clearly marked so that delivery vehicles enter/exit through stabilized areas with vehicle tracking controls (See Vehicle Tracking Control Fact Sheet).
  - Provide storage in accordance with Spill Protection, Control and Countermeasures (SPCC) requirements and plans and provide cover and impermeable perimeter control, as necessary, for hazardous materials and contaminated soils that must be stored on site.
  - Ensure that storage containers are regularly inspected for leaks, corrosion, support or foundation failure, or other signs of deterioration and tested for soundness.
  - Reuse and recycle construction materials when possible.

- **Designate Concrete Washout Areas**. Concrete contractors should be encouraged to use the washout facilities at their own plants or dispatch facilities when feasible; however, concrete washout commonly occurs on construction sites. If it is necessary to provide for concrete washout areas on-site, designate specific washout areas and design facilities to handle anticipated washout water. Washout areas should also be provided for paint and stucco operations. Because washout areas can be a source of pollutants from leaks or spills, care must be taken with regard to their placement and proper use. See the Concrete Washout Area Fact Sheet for detailed guidance.

  Both self-constructed and prefabricated washout containers can fill up quickly when concrete, paint, and stucco work are occurring on large portions of the site. Be sure to check for evidence that contractors are using the washout areas and not dumping materials onto the ground or into drainage facilities. If the washout areas are not being used regularly, consider posting additional signage, relocating the facilities to more convenient locations, or providing training to workers and contractors.

  When concrete, paint, or stucco is part of the construction process, consider these practices which will help prevent contamination of stormwater. Include the locations of these areas and the maintenance and inspection procedures in the SWMP.

MM-3 Good Housekeeping Practices (GH)

- Do not washout concrete trucks or equipment into storm drains, streets, gutters, uncontained areas, or streams. Only use designated washout areas.
- Establish washout areas and advertise their locations with signs. Ensure that signage remains in good repair.
- Provide adequate containment for the amount of wash water that will be used.
- Inspect washout structures daily to detect leaks or tears and to identify when materials need to be removed.
- Dispose of materials properly. The preferred method is to allow the water to evaporate and to recycle the hardened concrete. Full service companies may provide dewatering services and should dispose of wastewater properly. Concrete wash water can be highly polluted. It should not be discharged to any surface water, storm sewer system, or allowed to infiltrate into the ground in the vicinity of waterbodies. Washwater should not be discharged to a sanitary sewer system without first receiving written permission from the system operator.

- **Establish Proper Equipment/Vehicle Fueling and Maintenance Practices**. Create a clearly designated on-site fueling and maintenance area that is clean and dry. The on-site fueling area should have a spill kit, and staff should know how to use it. If possible, conduct vehicle fueling and maintenance activities in a covered area. Consider the following practices to help prevent the discharge of pollutants to stormwater from equipment/vehicle fueling and maintenance. Include the locations of designated fueling and maintenance areas and inspection and maintenance procedures in the SWMP.
  - Train employees and subcontractors in proper fueling procedures (stay with vehicles during fueling, proper use of pumps, emergency shutoff valves, etc.).
  - Inspect on-site vehicles and equipment regularly for leaks, equipment damage, and other service problems.
  - Clearly designate vehicle/equipment service areas away from drainage facilities and watercourses to prevent stormwater run-on and runoff.
  - Use drip pans, drip cloths, or absorbent pads when replacing spent fluids.
  - Collect all spent fluids, store in appropriate labeled containers in the proper storage areas, and recycle fluids whenever possible.

- **Control Equipment/Vehicle Washing and Allowable Non-Stormwater Discharges.** Implement practices to prevent contamination of surface and groundwater from equipment and vehicle wash water. Representative practices include:
  - Educate employees and subcontractors on proper washing procedures.
  - Use off-site washing facilities, when available.
  - Clearly mark the washing areas and inform workers that all washing must occur in this area.
  - Contain wash water and treat it using BMPs. Infiltrate washwater when possible, but maintain separation from drainage paths and waterbodies.

Good Housekeeping Practices (GH) MM-3

- Use high-pressure water spray at vehicle washing facilities without detergents. Water alone can remove most dirt adequately.
- Do not conduct other activities, such as vehicle repairs, in the wash area.
- Include the location of the washing facilities and the inspection and maintenance procedures in the SWMP.

- **Develop a Spill Prevention and Response Plan.** Spill prevention and response procedures must be identified in the SWMP. Representative procedures include identifying ways to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and response. The plan should also specify material handling procedures and storage requirements and ensure that clear and concise spill cleanup procedures are provided and posted for areas in which spills may potentially occur. When developing a spill prevention plan, include the following:
  - Note the locations of chemical storage areas, storm drains, tributary drainage areas, surface waterbodies on or near the site, and measures to stop spills from leaving the site.
  - Provide proper handling and safety procedures for each type of waste. Keep Material Safety Data Sheets (MSDSs) for chemical used on site with the SWMP.
  - Establish an education program for employees and subcontractors on the potential hazards to humans and the environment from spills and leaks.
  - Specify how to notify appropriate authorities, such as police and fire departments, hospitals, or municipal sewage treatment facilities to request assistance. Emergency procedures and contact numbers should be provided in the SWMP and posted at storage locations.
  - Describe the procedures, equipment and materials for immediate cleanup of spills and proper disposal.
  - Identify personnel responsible for implementing the plan in the event of a spill. Update the spill prevention plan and clean up materials as changes occur to the types of chemicals stored and used at the facility.

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DESIGNED BY: CFC
DRAWN BY: CFC
CHECKED BY: CFC
PROJECT NO. 01–0415.001.00
DOC CON # 0024–GESC DTL
SHEET 24 OF 29

Spill Prevention, Control, and Countermeasure (SPCC) Plan

Construction sites may be subject to 40 CFR Part 112 regulations that require the preparation and implementation of a SPCC Plan to prevent oil spills from aboveground and underground storage tanks. The facility is subject to this rule if it is a non-transportation-related facility that:

- Has a total storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons.
- Could reasonably be expected to discharge oil in quantities that may be harmful to navigable waters of the United States and adjoining shorelines.

Furthermore, if the facility is subject to 40 CFR Part 112, the SWMP should reference the SPCC Plan. To find out more about SPCC Plans, see EPA's website on SPPC at www.epa.gov/oilspill/spcc.htm.

Reporting Oil Spills

In the event of an oil spill, contact the National Response Center toll free at 1-800-424- 8802 for assistance, or for more details, visit their website: www.nrc.uscg.mil.

Maintenance and Removal

Effective implementation of good housekeeping practices is dependent on clear designation of personnel responsible for supervising and implementing good housekeeping programs, such as site cleanup and disposal of trash and debris, hazardous material management and disposal, vehicle and equipment maintenance, and other practices. Emergency response "drills" may aid in emergency preparedness.

Checklists may be helpful in good housekeeping efforts.

Staging and storage areas require permanent stabilization when the areas are no longer being used for construction-related activities.

Construction-related materials, debris and waste must be removed from the construction site once construction is complete.

Design Details

See the following Fact Sheets for related Design Details:

MM-1 Concrete Washout Area

MM-2 Stockpile Management

SM-4 Vehicle Tracking Control

Design details are not necessary for other good housekeeping practices; however, be sure to designate where specific practices will occur on the appropriate construction drawings.

Description

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

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

Appropriate Uses

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

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

Design and Installation

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

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

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

Seedbed Preparation

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

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

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

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

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

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

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

Seed Mix for Temporary Vegetation

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

Seed Mix for Permanent Revegetation

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

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

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 Name[a]	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[e]					
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.

Western Engineering Consultants, inc LLC
127 S. DENVER AVE
FT. LUPTON, CO 80621
www.westernec.com
email@westernec.com
(720) 685-9951
FAX (720) 294-1330

No.	REVISION	DATE	BY
0	INITIAL RELEASE	03/28/22	CFC
1	REV PER TOWN COMMENTS 05/02/22	06/20/22	CFC

TRAILERS DIRECT EXPRESS
CONTACT: CRAIG OWEN
2900 S TELEPHONE ROAD SUITE 220
MOORE, OK 73160
(405)701-1927
craig.owen@trailersdirectexpress.com

EROSION CONTROL DETAILS
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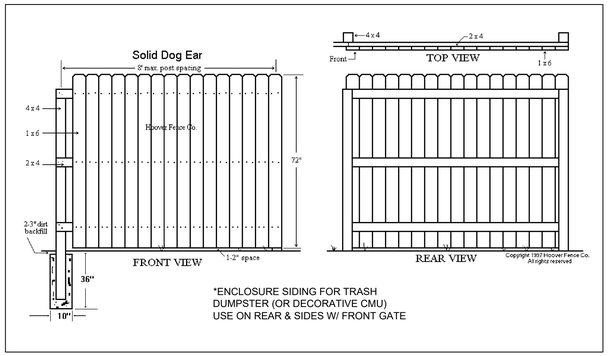
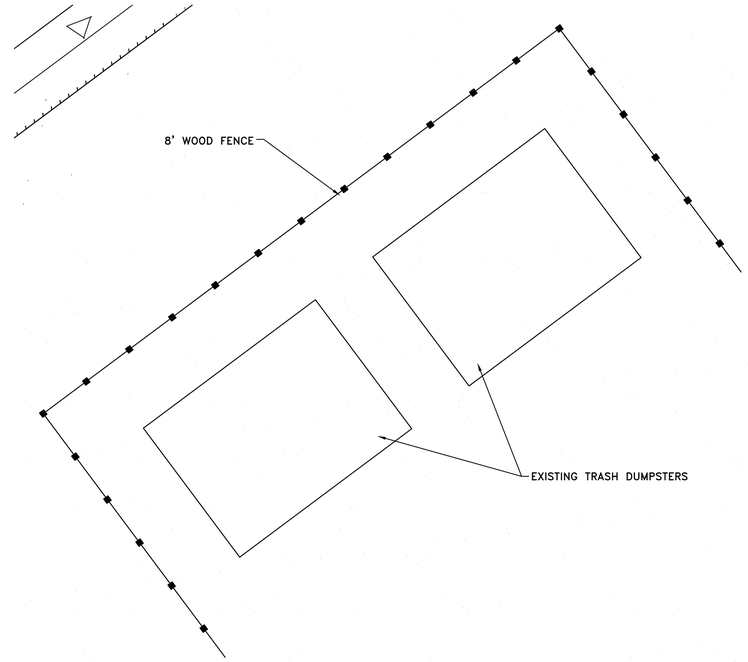
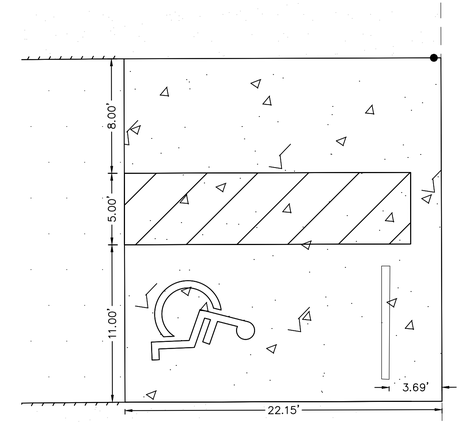
DOC CON # 0025-GESC DTL
SHEET 25 OF 29



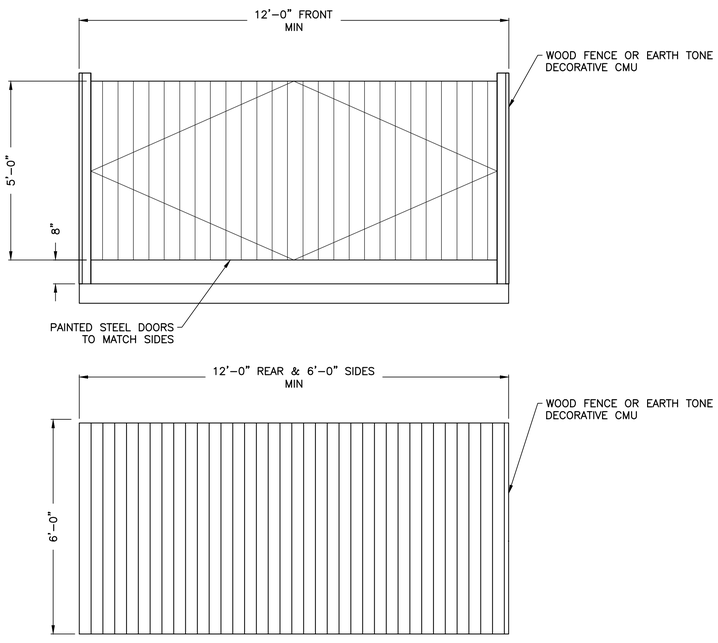
WOOD FENCE DETAIL



TRASH ENCLOSURE BLOWUP

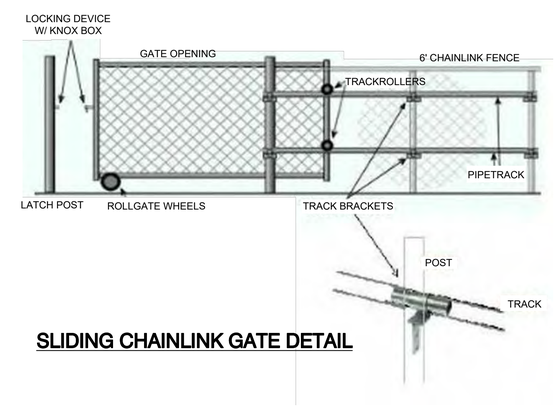


ADA PARKING BLOWUP



ALTERNATIVE TRASH ENCLOSURE

EXISTING CHAINLINK FENCE DETAIL



SLIDING CHAINLINK GATE DETAIL

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127 S. DENVER AVE
FT. LUPTON, CO 80621
www.westernec.com
emc@westernec.com
(720) 685-9951
FAX (720) 294-1330

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SHEET 26 OF 29

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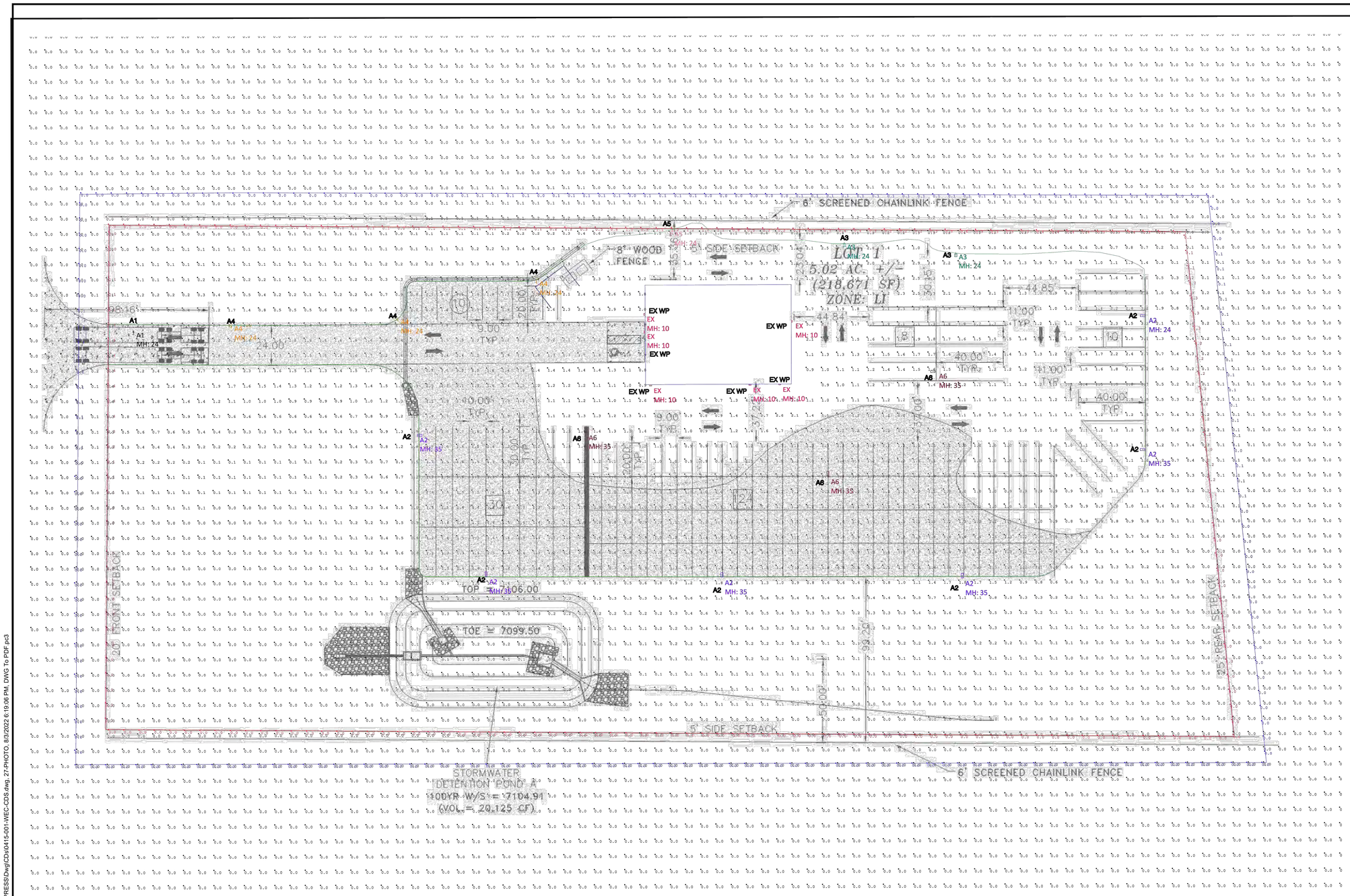

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
20' FROM PROPERTY LINE	Illuminance	Fc	0.03	0.1	0.0	N.A.	N.A.
ENTIRE SITE	Illuminance	Fc	0.20	7.3	0.0	N.A.	N.A.
PROPERTY LINE	Illuminance	Fc	0.13	1.2	0.0	N.A.	N.A.
PARKING	Illuminance	Fc	1.50	7.3	0.7	2.14	10.43

Luminaire Schedule						
Symbol	Qty	Label	Lum. Watts	Lum. Lumens	LLF	Description
	1	A1	108	12187	0.900	GALN-SA2C-750-U-SLL
	6	A2	108	14107	0.900	GALN-SA2C-750-U-T4FT
	2	A3	108	10181	0.900	GALN-SA2C-750-U-T4FT-HSS
	3	A4	108	14148	0.900	GALN-SA2C-750-U-T4W
	1	A5	108	10227	0.900	GALN-SA2C-750-U-T4W-HSS
	3	A6	108	14797	0.900	GALN-SA2C-750-U-5WQ
	6	EX	30	3000	0.900	EXISTING

ILLUMINATION SYSTEMS

5 SOUTH KALAMATH STREET
DENVER, CO 80223
PHONE: 303.295.2900
FAX: 303.293.8337
WWW.ILLUMSYS.COM

TRAILERS DIRECT EXPRESS

SITE PHOTOMETRIC

DATE:5/17/2022

PHOTOMETRICS ARE NOT TO SCALE

DRAWINGS ARE FOR ESTIMATING PURPOSES ONLY.

FOOT-CANDLE VALUES ARE PREDICTED AT HORIZONTAL CALCULATIONS UNLESS SPECIFIED OTHERWISE. ACTUAL FOOT-CANDLES MAY VARY.

FINAL CONSTRUCTION DRAWINGS & CALCULATIONS ARE THE RESPONSIBILITY OF A LICENSED ARCHITECT OR ENGINEER.

MOUNTING HEIGHT:
POLES: 24' - 0" A.F.F.
WALL PACKS: 10' - 0" A.F.F.

CALCULATION SPACING:
10' - 0" x 10' - 0"

FOOTCANDLE CALC HEIGHT:
0' - 0" A.F.F.

ADDITIONAL NOTES:

CREATED BY:
ELSA JERDE

FOR PRICING AND AVAILABILITY, CONTACT ILLUMINATION SYSTEMS AT 303.295.2900

DSC DESIGN, SUPPORT & CONTROLS

M

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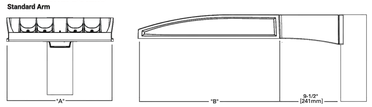

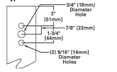

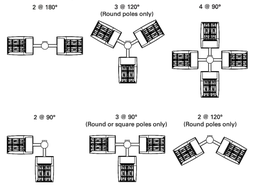

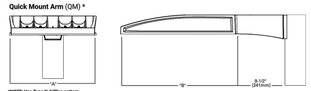

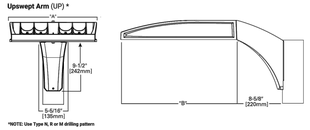

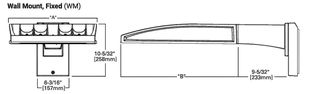

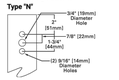

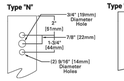

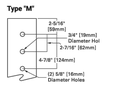

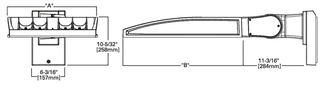

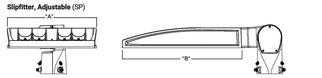

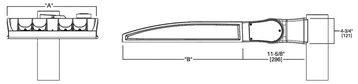

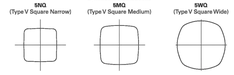

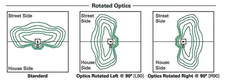

ILLUMINATION SYSTEMS	**Description :** GALN-SA2-750-U **Project Name:** Trailers Direct Express **Notes:** - SSL - T4FT - T4FT-HSS - T4W - T4W-HSS - 5WQ	TYPE: A1-A6

Streetworks

GLAN Galleon II

Area / Site Luminaire

Product Features

Light ARchitect™

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Distributions page 5
- Product Specifications page 5
- Energy and Performance Data page 6
- Control Options page 10

Product Certifications

Quick Facts

- Lumen packages range from 3,300 - 73,500 (33W - 552W)
- 16 optical distributions
- Efficacy up to 159 lumens per watt
- Options to meet Buy American and other domestic preference requirements

Connected Systems

- WaveLinx Lite
- WaveLinx

Dimensional Details

Standard Arm

Number of Light Squares	Width "A"	Housing Length "B"	Weight with Standard or QM Arm	EPA with Standard or QM Arm
1-4	16"	22"	29 lb	0.95
5-6	22"	22"	39 lb	0.95
7-9	22"	28-1/8"	48 lb	1.1

NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

NOTES:
1. Visit https://www.designlights.org/search/ to confirm qualification. Not all product variations are DLC qualified.
2. IDA Certified for 3000K CCT and warmer only.

Ordering Information

SAMPLE NUMBER: **GLAN-SA4C-740-U-T4FT-GM**

Product Family [1, 2]	Light Engine: Configuration	Light Engine: Drive Current	Color Temperature	Voltage	Distribution	Mounting	Finish
GLAN=Galleon II **BAA-GLAN**= Galleon II Buy American Act Compliant [30] **TAA-GLAN**= Galleon II Trade Agreements Act Compliant [30]	**SA1**=1 Square **SA2**=2 Squares **SA3**=3 Squares **SA4**=4 Squares **SA5**=5 Squares **SA6**=6 Squares **SA7**=7 Squares **SA8**=8 Squares **SA9**=9 Squares	**A**=600mA **B**=800mA **C**=1000mA **D**=1200mA [4, 17]	**722**=70CRI, 2200K **727**=70CRI, 2700K **730**=70CRI, 3000K **735**=70CRI, 3500K **740**=70CRI, 4000K **750**=70CRI, 5000K **760**=70CRI, 6000K **827**=80CRI, 2700K **830**=80CRI, 3000K **AMB**=Amber, 590nm [15, 17]	**U**=120-277V **H**=347V-480V [7, 29] **1**=120V **2**=208V **3**=240V **4**=277V **8**=480V [7, 29] **9**=347V [7] **DV**=277V-480V DuraVolt Drivers [27, 28, 29]	**T2**=Type II **T2R**=Type II Roadway **T3**=Type III **T3R**=Type III Roadway **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **5NQ**=Type V Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **AFL**=Automotive Frontline	**[Blank]**=Standard Pole Mount Arm **QM**=Standard Pole Mount Arm with Quick Mount Adaptor **PA**=Pole Mount, Adjustable **SP**=Slipfitter, Adjustable [8] **MA**=Mast Arm, Fixed **WM**=Wall Mount, Fixed **WA**=Wall Mount, Adjustable **UP**=Upswept Arm	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **RALXX**=Custom Color

Options (Add as Suffix)	Controls and Systems Options (Add as Suffix)	Accessories (Order Separately) [31]
DIM=External 0-10V Dimming Leads [20] **F**=Single Fuse (120, 277 or 347V Specify Voltage) **FF**=Double Fuse (208, 240 or 480V Specify Voltage) **20K**=20kV UL 1449 fused surge protective device [10] **2L**=Two Circuits [10] **TB**=3-Position Terminal Block **HA**=50°C High Ambient **HSS**=Installed House Side Shield [18] **GRSBK**=Glare Reducing Shield, Black [23] **GRSWH**=Glare Reducing Shield, White [23] **LCF**=Light Square Trim Painted to Match Housing [26] **TH**=Tool-less Door Hardware [5] **CC**=Coastal Construction finish [3] **L90**=Optics Rotated 90° Left **R90**=Optics Rotated 90° Right **AHD145**=After Hours Dim, 5 Hours [22] **AHD245**=After Hours Dim, 6 Hours [22] **AHD255**=After Hours Dim, 7 Hours [22] **AHD355**=After Hours Dim, 8 Hours [22] **DALI**=DALI Drivers	**BPC**=Button Type Photocontrol [6] **PR**=NEMA 3-PIN Photocontrol Receptacle **PR7**=NEMA 7-PIN Photocontrol Receptacle [21] **SPB2**=Dimming Motion Sensor, 9'-20' mounting [24] **SPB4**=Dimming Motion Sensor, 21'-40' mounting [24] **SPB2/X**=Dimming Motion Sensor, limited square count, 9'-20' mounting [24] **SPB4/X**=Dimming Motion Sensor, limited square count, 21'-40' mounting [24] **ZW**=WaveLinx Module and 4-PIN Receptacle [19] **ZD**=WaveLinx Module with DALI driver and 4-PIN Receptacle [19] **ZW-SWPD4XX**=WaveLinx Sensor Only, 7-15ft [19, 12, 13] **ZW-SWPD5XX**=WaveLinx Sensor Only, 15-40ft [19, 12, 13] **ZW-WOBXX**=WaveLinx Sensor with Bluetooth, 7-15ft [19, 12, 13] **ZW-WOFXX**=WaveLinx Sensor with Bluetooth, 15-40ft [19, 12, 13] **ZD-SWPD4XX**=WaveLinx Sensor Only, 7-15ft [19, 12, 13] **ZD-SWPD5XX**=WaveLinx Sensor Only, 15-40ft [19, 12, 13] **ZD-WOBXX**=WaveLinx Sensor with Bluetooth, 7-15ft [19, 12, 13] **ZD-WOFXX**=WaveLinx Sensor with Bluetooth, 15-40ft [19, 12, 13] **DIM10-MS/DIM-L20**=Synapse Occupancy Sensor (9'-20' Mounting) [19] **DIM10-MS/DIM-L40**=Synapse Occupancy Sensor (21'-40' Mounting) [19]	**OA/RA1016**=NEMA Photocontrol Multi-Tap - 105-285V **OA/RA1027**=NEMA Photocontrol - 480V **OA/RA1201**=NEMA Photocontrol - 347V **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=120V Photocontrol **MA1252**=10kV Surge Module Replacement **MA1036-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1037-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **MA1197-XX**=3@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1188-XX**=4@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1189-XX**=2@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1190-XX**=3@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1191-XX**=2@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1038-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1039-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1192-XX**=3@120° Tenon Adapter for 3-1/2" O.D. Tenon **MA1193-XX**=4@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1194-XX**=2@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1195-XX**=3@90° Tenon Adapter for 3-1/2" O.D. Tenon **SRA238**=Adapter kit for mounting to 2-3/8" O.D. Tenon **LS/HSS**=Field Installed House Side Shield [9, 18] **LS/GRSBK**=Glare Reducing Shield, Black [9, 23] **LS/GRSWH**=Glare Reducing Shield, White [9, 23] **LS/PFS**=Perimeter Shield, Black [16] **WOLC-7P-10A**=WaveLinx Outdoor Control Module [11, 19] **WOA-XX**=WaveLinx Wireless Sensor, 7'–15' Mounting Height [12, 13, 14, 19] **WOE-XX**=WaveLinx Wireless Sensor, 15'–40' Mounting Height [12, 13, 14, 19]

NOTES:
1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
3. Coastal construction finish salt spray tested to over 5,000-hours per ASTM B117, with a scribe rating of 9 per ASTM D1654. Not available with TH option.
4. Drive current 1200mA not available with color temperatures 722, 727 or 830 when either HA or HSS options are selected.
5. TH option not 3G rated. Not available with Coastal Construction (CC) option.
6. Not available with voltage options H, 8 or 9.
7. Requires the use of an internal step down transformer when combined with sensor options. Not available in combination with the HA high ambient and sensor options at 1A.
8. Adjustable Slipfitter arm limited to vertical 3" tenon. For mounting to 2-3/8" O.D. tenons, order accessory SRA238.
9. One required for each Light Square.
10. 2L is not available with SPB at 347V or 480V. Not available with WaveLinx or Enlighted sensors, or 20kV surge option.
11. Requires PR7.
12. Replace XX with sensor color (WH, BZ or BK.)
13. WAC Gateway required to enable field-configurability: Order WAC-PoE and WPOE-120 (10V to PoE injector) power supply if needed. WAC not required for LC Bluetooth sensors.
14. Requires ZW or ZD receptacle.
15. Narrow-band 590nm +/- 5nm for wildlife and observatory use. Choose drive current A; supplied at 500mA drive current only. Exact luminaire wattage available in IES files. Available with 5WQ, 5MQ, SL2, SL3 and SL4 distributions. Can be used with HSS option.
16. Set of 4 pcs. One set required per Light Square.
17. Not available with HA option.
18. Not for use with 5NQ, 5MQ, 5WQ or RW optics. A black trim plate is used when HSS is selected.
19. Cannot be used with other control options.
20. Low voltage control lead brought out 18" outside fixture. Not available with DALI or integrated controls options
21. Not available if any SPB, LWR, or WaveLinx sensor is selected. Motion sensor has an integral photocell.
22. Requires the use of BPC photocontrol or the PR7 or PR photocontrol receptacle with photocontrol accessory.
23. Not for use with T4FT, T4W or SL4 optics. See IES files for details.
24. Sensor configuration mobile application required for configuration. See controls page for details.
25. Replace X with number of Light Squares controlled by the SPB, referencing the "SPB/X Availability Table" on the controls page.
26. Not available with HSS, GRSWH or GRSBK.
27. DuraVolt drivers feature added protection from power quality issues such as loss of neutral, transients and voltage fluctuations. Visit www.signify.com/duravolt for more information.
28. Not available in 1 square configuration at 800mA and below. Not available with any control option except SPB.
29. 480V not to be used with ungrounded or impedance grounded systems.
30. Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1933 (BAA) or Trade Agreements Act of 1979 (TAA), respectively. Please refer to DOMESTIC PREFERENCES website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.
31. Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information.

LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology	**D**=Standard Dome Camera **H**=Hi-Res Dome Camera **Z**=Remote PTZ Camera	**C**=Cellular, No SIM **A**=Cellular, AT&T **V**=Cellular, Verizon **S**=Cellular, Sprint	**R**=Cellular, Rogers **W**=Wi-Fi Networking w/ Omni-Directional Antenna **E**=Ethernet Networking

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Mounting Details

Mounting Details

Adjustable Arm Range of Motion
- Wall Mount (WA), Slipfitter (SP) and Pole Mount (PA)
- Adjustable in increments of 5°
- Must maintain downward facing orientation

Fixture Weights and EPAs

Tilt Angle (Degrees)	Number of Light Squares	Weight	1 @ 90°	2 @ 180°	2 @ 90°	2 @ 120°	3 @ 90°	3 @ 120°	4 @ 90°
0°	1-4	33.5 lb (15.2 kg)	0.85	1.70	1.46	1.66	2.31	2.25	2.35
	5-6	43.5 lb (19.7 kg)	0.86	1.71	1.62	1.80	2.49	2.35	2.50
	7-9	52.5 lb (23.8 kg)	0.98	1.95	1.75	1.98	2.73	2.55	2.76
15°	1-4	33.5 lb (15.2 kg)	1.10	1.71	1.95	2.26	2.81	3.30	2.87
	5-6	43.5 lb (19.7 kg)	1.42	1.71	2.27	2.72	3.13	3.63	3.15
	7-9	52.5 lb (23.8 kg)	1.69	1.96	2.67	3.22	3.65	4.38	3.72
30°	1-4	33.5 lb (15.2 kg)	1.72	1.81	2.58	3.21	3.44	4.59	3.53
	5-6	43.5 lb (19.7 kg)	2.26	2.29	3.11	4.00	3.97	5.27	4.00
	7-9	52.5 lb (23.8 kg)	2.75	2.85	3.73	4.83	4.71	6.45	4.81
45°	1-4	33.5 lb (15.2 kg)	2.25	2.36	3.10	4.00	3.96	5.63	4.08
	5-6	43.5 lb (19.7 kg)	2.96	2.99	3.81	5.06	4.67	6.49	4.71
	7-9	52.5 lb (23.8 kg)	3.63	3.76	3.73	6.17	5.59	8.03	5.73
60°	1-4	33.5 lb (15.2 kg)	2.63	2.77	3.49	4.58	4.34	6.21	4.48
	5-6	43.5 lb (19.7 kg)	3.46	3.51	4.32	5.84	5.19	7.01	5.22
	7-9	52.5 lb (23.8 kg)	4.27	4.44	5.25	7.15	6.23	8.80	6.40

Optical Distributions

Product Specifications

Construction
- Die-cast aluminum housing and heat sink
- Three housing sizes, using 1 to 9 light squares
- Driver compartment utilizes hinged door with captive fasteners

Optics
- High-efficiency injection-molded AccuLED Optics technology
- 16 optical distributions for area site and roadway applications
- 3 shielding options include HSS, GRS and PFS
- IDA certified (3000K CCT and warmer only, arms at 0° tilt)

Electrical
- Removable power tray assembly includes drivers, surge modules and control modules for ease of maintenance and serviceability
- Standard with 0-10V dimming
- Standard with 10kV surge module, optional 20kV surge module
- Suitable for operation in -40°C to 40°C ambient environments. Optional 50°C high ambient (HA) configuration

Mounting
- Arms are factory installed, enabling closed-housing installation
- All arms suitable for round or square pole installation
- All arms provide clearance for multiple fixture installations at 90°

Finish
- 6 standard finishes use super durable TGIC polyester powder coat paint, providing 2.5 mil nominal thickness and salt-spray tested to 3,000 hours per ASTM B117
- RAL and custom color matches available
- Coastal Construction (CC) option salt-spray tested to 5,000 hours per ASTM B117, achieving a scribe rating of 9 per ASTM D1654

Warranty
- Five year limited warranty

Energy and Performance Data

Lumen Maintenance (TM-21)

Drive Current	Ambient Temperature	25,000 hours*	50,000 hours*	60,000 hours*	100,000 hours**	Theoretical L70 hours**
Up to 1A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.7%	98.3%	98.1%	97.4%	> 1.9M
	50°C	98.2%	97.2%	96.8%	95.2%	> 851,000
1.2A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.5%	97.9%	97.7%	96.7%	> 1.3M

* Supported by IES TM-21 standards
** Theoretical values represent estimations commonly used; however, refer to the IES position on LED Product Lifetime Prediction, IES PS-10-18, explaining proper use of IES TM-21 and LM-80.

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

Performance Table, Drive Current "A" (615mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		33	63	93	121	154	182	215	244	274
Input Current @ 120V		0.283	0.529	0.778	1.058	1.310	1.556	1.839	2.089	2.335
Input Current @ 208V		0.165	0.309	0.460	0.618	0.771	0.919	1.082	1.240	1.379
Input Current @ 240V		0.143	0.270	0.398	0.540	0.671	0.796	0.944	1.078	1.194
Input Current @ 277V		0.125	0.237	0.352	0.473	0.581	0.705	0.818	0.962	1.057
Input Current @ 347V		0.098	0.181	0.272	0.362	0.454	0.544	0.636	0.738	0.816
Input Current @ 480V		0.073	0.133	0.200	0.267	0.335	0.400	0.470	0.554	0.600
Optics										
T2	4000K Lumens	4,654	9,249	13,730	18,194	23,032	27,273	32,034	37,138	41,694
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	141	147	148	150	150	150	149	152	152
T2R	4000K Lumens	4,716	9,372	13,913	18,437	23,340	27,637	32,462	37,634	42,251
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4
	Lumens per Watt	143	149	150	152	152	152	151	154	154
T3	4000K Lumens	4,589	9,120	13,538	17,940	22,711	26,892	31,587	36,620	41,112
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G4
	Lumens per Watt	139	145	146	148	147	148	147	150	150
T3R	4000K Lumens	4,735	9,411	13,970	18,513	23,436	27,751	32,596	37,790	42,425
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	143	149	150	153	152	152	152	155	155
T4FT	4000K Lumens	4,617	9,176	13,622	18,051	22,851	27,058	31,782	36,847	41,366
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	140	146	146	149	148	149	148	151	151
T4W	4000K Lumens	4,631	9,203	13,662	18,104	22,918	27,138	31,876	36,955	41,488
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	140	146	147	150	149	149	148	151	151
SL2	4000K Lumens	4,619	9,180	13,627	18,058	22,860	27,069	31,795	36,861	41,383
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5
	Lumens per Watt	140	146	147	149	148	149	148	151	151
SL3	4000K Lumens	4,586	9,115	13,531	17,931	22,699	26,879	31,571	36,602	41,091
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	139	145	145	148	147	148	147	150	150
SL4	4000K Lumens	4,529	9,002	13,363	17,708	22,417	26,544	31,178	36,146	40,580
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	137	143	144	146	146	146	145	148	148
5NQ	4000K Lumens	4,829	9,598	14,247	18,880	23,901	28,301	33,242	38,539	43,266
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3
	Lumens per Watt	146	152	153	156	155	155	155	158	158
5MQ	4000K Lumens	4,853	9,645	14,318	18,974	24,020	28,442	33,407	38,731	43,482
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	147	153	154	157	156	156	155	159	159
5WQ	4000K Lumens	4,843	9,625	14,288	18,934	23,969	28,382	33,337	38,649	43,390
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	147	153	154	156	156	156	155	158	158
SLL/ SLR	4000K Lumens	3,989	7,927	11,768	15,594	19,741	23,375	27,456	31,831	35,736
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
	Lumens per Watt	121	126	127	129	128	128	128	130	130
RW	4000K Lumens	4,774	9,488	14,085	18,665	23,628	27,979	32,863	38,100	42,774
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	145	151	151	154	153	154	153	156	156
AFL	4000K Lumens	4,673	9,286	13,785	18,268	23,126	27,384	32,164	37,290	41,864
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
	Lumens per Watt	142	147	148	151	150	150	150	153	153

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "B" (800mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		44	82	121	164	204	243	286	325	364
Input Current @ 120V		0.367	0.689	1.014	1.378	1.704	2.027	2.393	2.716	3.041
Input Current @ 208V		0.213	0.401	0.594	0.802	0.997	1.188	1.400	1.605	1.782
Input Current @ 240V		0.184	0.347	0.510	0.694	0.860	1.021	1.210	1.386	1.531
Input Current @ 277V		0.160	0.303	0.449	0.605	0.757	0.898	1.065	1.242	1.347
Input Current @ 347V		0.125	0.235	0.355	0.471	0.592	0.710	0.828	0.958	1.065
Input Current @ 480V		0.092	0.172	0.258	0.344	0.432	0.517	0.605	0.706	0.775
Optics										
T2	4000K Lumens	5,790	11,508	17,083	22,638	28,658	33,935	39,859	46,210	51,879
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	132	140	141	138	140	140	139	142	143
T2R	4000K Lumens	5,868	11,662	17,311	22,941	29,041	34,388	40,391	46,827	52,572
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
	Lumens per Watt	133	142	143	140	142	142	141	144	144
T3	4000K Lumens	5,710	11,347	16,845	22,322	28,258	33,461	39,303	45,565	51,155
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5
	Lumens per Watt	130	138	139	136	139	138	137	140	141
T3R	4000K Lumens	5,892	11,710	17,383	23,035	29,161	34,530	40,558	47,020	52,788
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	134	143	144	140	143	142	142	145	145
T4FT	4000K Lumens	5,745	11,418	16,949	22,460	28,433	33,668	39,546	45,847	51,471
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	139	140	137	139	139	138	141	141
T4W	4000K Lumens	5,762	11,451	16,999	22,526	28,517	33,767	39,662	45,982	51,622
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	140	140	137	140	139	139	141	142
SL2	4000K Lumens	5,747	11,422	16,956	22,469	28,444	33,681	39,561	45,865	51,491
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	139	140	137	139	139	138	141	141
SL3	4000K Lumens	5,707	11,342	16,836	22,311	28,244	33,444	39,283	45,542	51,129
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	130	138	139	136	138	138	137	140	140
SL4	4000K Lumens	5,636	11,201	16,627	22,034	27,893	33,028	38,794	44,976	50,493
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	128	137	137	134	137	136	136	138	139
5NQ	4000K Lumens	6,009	11,942	17,727	23,492	29,739	35,214	41,362	47,953	53,835
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	137	146	147	143	146	145	145	148	148
5MQ	4000K Lumens	6,039	12,001	17,816	23,609	29,887	35,389	41,568	48,191	54,103
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	137	146	147	144	147	146	145	148	149
5WQ	4000K Lumens	6,026	11,976	17,778	23,559	29,824	35,315	41,480	48,090	53,989
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	137	146	147	144	146	145	145	148	148
SLL/ SLR	4000K Lumens	4,963	9,863	14,642	19,403	24,563	29,085	34,163	39,607	44,465
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	113	120	121	118	120	120	119	122	122
RW	4000K Lumens	5,940	11,806	17,526	23,224	29,400	34,813	40,891	47,407	53,222
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	135	144	145	142	144	143	143	146	146
AFL	4000K Lumens	5,814	11,555	17,153	22,730	28,775	34,073	40,021	46,398	52,090
	BUG Rating	B1-U0-G1	B2-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4
	Lumens per Watt	132	141	142	139	141	140	140	143	143

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Performance Table, Drive Current "C" (1050mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		57	108	160	213	269	321	377	429	481
Input Current @ 120V		0.478	0.905	1.338	1.810	2.244	2.675	3.150	3.584	4.013
Input Current @ 208V		0.279	0.532	0.780	1.064	1.313	1.559	1.845	2.093	2.339
Input Current @ 240V		0.243	0.458	0.664	0.916	1.123	1.328	1.582	1.788	1.991
Input Current @ 277V		0.213	0.404	0.582	0.808	0.997	1.164	1.401	1.589	1.745
Input Current @ 347V		0.164	0.322	0.471	0.644	0.795	0.943	1.117	1.269	1.414
Input Current @ 480V		0.121	0.235	0.341	0.469	0.579	0.681	0.814	0.923	1.022
Optics										
T2	4000K Lumens	7,154	14,219	21,107	27,970	35,408	41,927	49,247	57,094	64,098
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	132	132	131	132	131	131	133	133
T2R	4000K Lumens	7,250	14,408	21,389	28,344	35,881	42,487	49,905	57,857	64,954
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	127	133	134	133	133	132	132	135	135
T3	4000K Lumens	7,054	14,020	20,812	27,580	34,914	41,342	48,560	56,297	63,203
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	130	130	129	130	129	129	131	131
T3R	4000K Lumens	7,280	14,468	21,477	28,461	36,029	42,663	50,111	58,096	65,222
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	128	134	134	134	134	133	133	135	136
T4FT	4000K Lumens	7,098	14,107	20,941	27,751	35,130	41,598	48,860	56,646	63,594
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	130	131	130	130	132	132
T4W	4000K Lumens	7,119	14,148	21,003	27,832	35,233	41,720	49,004	56,812	63,781
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	131	131	130	130	132	133
SL2	4000K Lumens	7,101	14,112	20,949	27,761	35,144	41,614	48,879	56,668	63,619
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	131	131	130	131	130	130	132	132
SL3	4000K Lumens	7,051	14,013	20,802	27,566	34,897	41,321	48,535	56,269	63,172
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	130	130	129	130	129	129	131	131
SL4	4000K Lumens	6,963	13,839	20,543	27,223	34,463	40,808	47,932	55,569	62,386
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	122	128	128	128	128	127	127	130	130
5NQ	4000K Lumens	7,424	14,755	21,903	29,025	36,743	43,508	51,104	59,247	66,515
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	130	137	137	136	137	136	136	138	138
5MQ	4000K Lumens	7,461	14,828	22,012	29,169	36,926	43,725	51,359	59,542	66,846
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	131	137	138	137	137	136	136	139	139
5WQ	4000K Lumens	7,445	14,797	21,966	29,108	36,849	43,633	51,250	59,417	66,705
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	131	137	137	137	137	136	136	139	139
SLL/ SLR	4000K Lumens	6,132	12,187	18,091	23,973	30,348	35,936	42,210	48,935	54,938
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	108	113	113	113	113	112	112	114	114
RW	4000K Lumens	7,340	14,587	21,653	28,694	36,325	43,013	50,522	58,573	65,757
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	129	135	135	135	135	134	134	137	137
AFL	4000K Lumens	7,183	14,276	21,193	28,084	35,552	42,098	49,448	57,327	64,359
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G4
	Lumens per Watt	126	132	132	132	132	131	131	134	134

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

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PROJECT NO.
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Performance Table, Drive Current "D" (1200mA)

Number of Light Squares		1	2	3	4	5	6	7	8	9
Nominal Power (Watts)		65	125	184	245	309	368	433	493	552
Input Current @ 120V		0.546	1.041	1.535	2.082	2.578	3.070	3.619	4.114	4.605
Input Current @ 208V		0.318	0.610	0.893	1.219	1.504	1.786	2.113	2.397	2.679
Input Current @ 240V		0.276	0.523	0.758	1.046	1.282	1.516	1.806	2.041	2.274
Input Current @ 277V		0.241	0.460	0.662	0.920	1.133	1.325	1.593	1.807	1.987
Input Current @ 347V		0.187	0.370	0.543	0.740	0.915	1.085	1.285	1.459	1.628
Input Current @ 480V		0.138	0.269	0.391	0.537	0.663	0.782	0.932	1.057	1.173
Optics										
T2	4000K Lumens	7,872	15,645	23,225	30,777	38,962	46,135	54,189	62,824	70,530
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	125	126	126	126	125	125	127	128
T2R	4000K Lumens	7,977	15,854	23,535	31,188	39,482	46,751	54,913	63,663	71,472
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	127	128	127	128	127	127	129	129
T3	4000K Lumens	7,762	15,427	22,901	30,348	38,418	45,491	53,433	61,947	69,546
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	123	124	124	124	124	123	126	126
T3R	4000K Lumens	8,010	15,930	23,632	31,317	39,645	46,944	55,139	63,925	71,767
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	127	128	128	128	128	127	130	130
T4FT	4000K Lumens	7,810	15,522	23,043	30,535	38,655	45,772	53,763	62,330	69,976
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	120	124	125	125	125	124	124	126	127
T4W	4000K Lumens	7,833	15,568	23,110	30,625	38,769	45,907	53,921	62,513	70,182
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	125	126	125	125	125	125	127	127
SL2	4000K Lumens	7,813	15,528	23,052	30,547	38,670	45,790	53,784	62,354	70,003
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	120	124	125	125	125	124	124	126	127
SL3	4000K Lumens	7,758	15,419	22,889	30,332	38,398	45,468	53,406	61,916	69,511
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	123	124	124	124	124	123	126	126
SL4	4000K Lumens	7,662	15,228	22,605	29,955	37,921	44,903	52,742	61,146	68,646
	BUG Rating	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	118	122	123	122	123	122	122	124	124
SNQ	4000K Lumens	8,169	16,235	24,101	31,938	40,431	47,874	56,232	65,193	73,190
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	126	130	131	130	131	130	130	132	133
SMQ	4000K Lumens	8,210	16,316	24,221	32,097	40,632	48,113	56,512	65,517	73,554
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	126	131	132	131	131	131	131	133	133
SWQ	4000K Lumens	8,192	16,282	24,170	32,029	40,546	48,011	56,393	65,379	73,399
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	126	130	131	131	131	130	130	133	133
SLL/ SLR	4000K Lumens	6,747	13,410	19,906	26,379	33,394	39,542	46,445	53,846	60,451
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	104	107	108	108	108	107	107	109	110
RW	4000K Lumens	8,076	16,050	23,826	31,574	39,970	47,329	55,592	64,450	72,355
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	124	128	129	129	129	129	128	131	131
AFL	4000K Lumens	7,904	15,709	23,320	30,902	39,120	46,323	54,410	63,079	70,817
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G4
	Lumens per Watt	122	126	127	126	127	126	126	128	128

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Control Options

0-10V (DIM)
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (BPC, PR and PR7)
Optional button-type photocontrol (BPC) and photocontrol receptacles (PR and PR7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PR7 receptacle.

After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

Dimming Occupancy Sensor (SPB)
These passive infrared (PIR) sensors are factory installed in the luminaire housing. When the SPB sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when no motion is detected. After a period of time, the luminaire turns off, and when motion is detected, the luminaire returns to full light output. The SPB sensor default parameters are listed in the table below, and can be configured utilizing the Sensor Configuration mobile application for iOS and Android devices. The SPB/X is configured to control only the specified number of light squares. An integral photocontrol can be activated with the app for "dusk-to-dawn" control or daylight harvesting - the factory default is off. Three sensor lenses are available to optimize the coverage pattern for mounting heights from 8'-40'. Four sensor colors are available; Bronze, Black, Gray and White, and are automatically selected based on the luminaire finish as indicated by the table below.

SPB sensor finish matched to luminaire finish

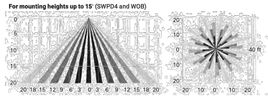
Luminaire Finish		SPB Sensor Finish
WH	White	White
BK	Black	Black
GM	Graphite Metallic	Black
BZ	Bronze	Bronze
AP	Gray	Gray
DP	Dark Platinum	Gray

SPB/X Availability Table

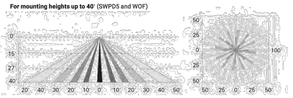
Fixture Square Count	Available SPB/X Square Count
1	Not Available
2	Not Available
3	Not Available
4	2
5	2 or 3
6	3
7	2, 3, 4 or 5
8	2, 3, 5 or 6
9	3 or 6

WaveLinx Wireless Control and Monitoring System
Operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. WaveLinx and WaveLinx Lite sensors utilize the Zhaga Book 18 compliant 4-PIN receptacle (ZD or ZW), while the WOLC control module utilizes a 7-PIN receptacle. ZW option provides 4-PIN receptacle and control module to enable future installation of WaveLinx sensors. ZD option provides 4-PIN receptacle and sensor-ready (SR) driver to enable future installation of WaveLinx sensors, power monitoring, and advanced functionality. WaveLinx (SWPD4 to SWPD5) outdoor wireless sensors offer passive infrared (PIR) occupancy and photocell for closed loop daylight harvesting, and can be factory or field-installed. Sensors are factory preset to dim down to 50% after 15 minutes of no motion detected. Two lens options are available for mounting heights of 7' to 40'. Use the WaveLinx mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets). WaveLinx Lite (WOF and WOB) outdoor wireless sensors provide PIR occupancy and photocell for closed loop daylight harvesting, and can be factory or field-installed. Sensors are factory preset to dim down to 50% after 15 minutes of no motion detected. Two lens options are available for mounting heights of 7' to 40'. Use the WaveLinx Lite mobile application for set-up and configuration. WAC not required. WaveLinx Outdoor Control Module (WOLC-7P-10A) accessory provides a photocontrol enabling astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.

For mounting heights up to 15' (SWPD4 and WOB)



For mounting heights up to 40' (SWPD5 and WOF)



LumenSafe Integrated Network Security Camera (LD)
Cooper Lighting Solutions brings ease of camera deployment to a whole new level. No additional wiring is needed beyond providing line power to the luminaire. A variety of networking options allows security integrators to design the optimal solution for active surveillance. As the ideal solution to meet the needs for active surveillance, the LumenSafe integrated network camera is a streamlined, outdoor-ready fixed dome that provides HDTV 1080p video. This IP camera is optimally designed for deployment in the video management system or security software platform of choice.

Synapse (DIM10)
SimplySNAP integrated wireless controls system by Synapse. Includes factory installed DIM10 Synapse control module and MS/DC motion sensor; requires additional Synapse system components for operation. Contact Synapse at www.synapsewireless.com for product support, warranty and terms and conditions.

Cooper Lighting Solutions
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Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com

Specifications and dimensions subject to change without notice.

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