CHALLENGER COMMUNITIES, LLC
BENT GRASS RESIDENTIAL FILING NO. 2
BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD – FALCON, CO
CONSTRUCTION DOCUMENTS - ENGINEERING RECORD DRAWINGS

SF-19-014

PROJECT CONTACTS

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EL PASO COUNTY, PLANNING & COMMUNITY DEVELOPMENT
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COLORADO SPRINGS, COLORADO 80910
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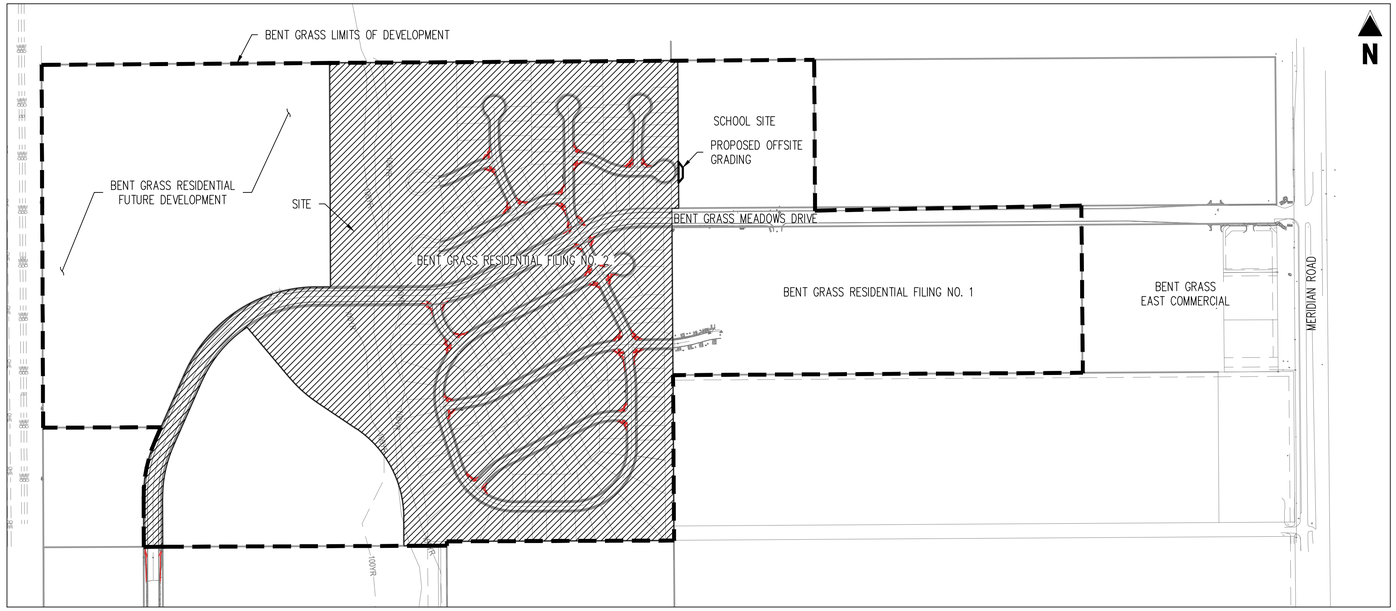
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SITE MAP
SCALE: 1"=300'

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SEE BENT GRASS RESIDENTIAL FILING NO. 2 GEC PLANS FOR GRADING AND EROSION CONTROL PLANS
SEE BENT GRASS RESIDENTIAL FILING NO. 2 UTILITY CONSTRUCTION PLANS FOR WATER AND SANITARY IMPROVEMENTS

Unresolved previous comment:

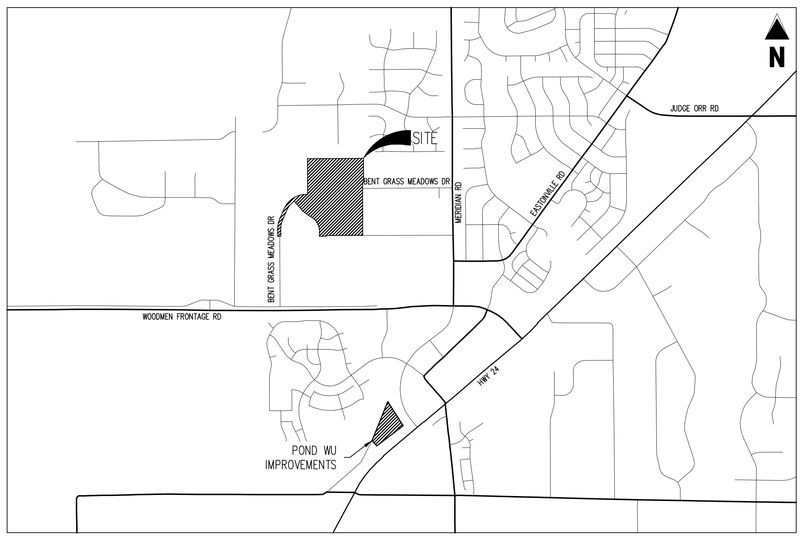
Please address the following two items from the Stormwater PA Punchlist, wherever appropriate. I did not see swale details when scrolling through this planset.

- Swale B (which is tributary to North Pond) not installed. Show deviation on as-builts.

- Swale E not installed. Show deviation on as-builts.

Review 2 update: per phone call with Brady, he will update the as-builts to label these swales as "not installed, "replaced by development in other fillings" or whatever the case may be. I would accept just a general note (outlined in red) on this cover page that discusses this, instead of trying to find every instance of those 2 swales thoughout this 38 page planset. Thanks.

SWALES B & E SHOWN IN THIS PLAN SET WERE NOT INSTALLED. THEY WERE REPLACED BY THE DEVELOPMENT OF OTHER FILINGS. CONVEYANCE SYSTEMS, SUCH AS STORM PIPE, WERE INSTALLED IN PLACE OF THE SWALES. SEE FALCON MEADOWS AT BENT GRASS FILING NO. 2, BY GALLOWAY & CO, APPROVED 4/26/22.



VICINITY MAP
1"=2,000'

ENGINEER'S STATEMENT
THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.

RONALD G. DENNIS, COLORADO P.E. NO. 0051622 — 4/20/20 DATE

OWNER'S STATEMENT
I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN AND ALL OF THE REQUIREMENT SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

~~LEE EISENHEIM~~ James Byers — 4/2/20 DATE
CHALLENGER HOMES, INC.

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

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

Approved
By: Elizabeth Nijkamp
Date:05/13/2020
El Paso County Planning & Community Development

JENNIFER IRVINE, P.E.
COUNTY ENGINEER / ECM ADMINISTRATOR

Check structures (2) per UDFCD (MHFD) detail added per engineer's request May 6, 2020.

See Resolution conditions and SIA.

SF1914
5/13/2020

WOODMEN HILLS METROPOLITAN DISTRICT
THESE CONSTRUCTION DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR SANITARY SEWER, WATER MAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION.

FOR AND BEHALF OF WOODMEN HILLS METROPOLITAN DISTRICT — DATE

FALCON FIRE PROTECTION DISTRICT
ALL FIRE HYDRANTS SHALL BE INSTALLED ACCORDING TO THE FALCON FIRE PROTECTION DISTRICT SPECIFICATIONS. THE NUMBER OF FIRE HYDRANTS AND HYDRANT LOCATIONS AS SHOWN ON THIS WATER INSTALLATION PLAN ARE CORRECT AND ADEQUATE TO SATISFY THE FIRE PROTECTION REQUIREMENTS AS SPECIFIED BY THE FALCON FIRE PROTECTION DISTRICT.

FOR AND BEHALF OF FALCON FIRE PROTECTION DISTRICT — DATE

LEGAL DESCRIPTION
BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS
ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE BEARING OF THE LINE BETWEEN THE SOUTHWEST CORNER OF SECTION 1, T13S, R65W AND THE WEST QUARTER CORNER SECTION 1, T13S, R65W IS N00°37'46"W AND MONUMENTED AS SHOWN:

BENCHMARK
THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

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

Know what's below. Call before you dig.

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

ENGINEERING RECORD DRAWINGS

COLORADO REGISTERED ENGINEER — 38164 — 03/16/2026 — PROFESSIONAL ENGINEER

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

COVER SHEET

ASB2514

C0.01
Sheet 1 of 38

W:\Challenger Homes Inc\DO, El Paso County (CLH000014.20)\Bent Grass\CAD\3.1 CIVIL\Plan Docs\[Civil1.26_C0.Cover Sheet.dwg, Anna Wallis - 3/5/2026

GENERAL CONSTRUCTION NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPLACED AT THE CONTRACTORS EXPENSE AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
3. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
4. ALL BACKFILL, SUB-BASE AND / OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED TO THE SOILS ENGINEERS RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION.
5. ALL STATIONING IS CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE INDICATED.
6. ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO THE EPC ECM APPENDIX K – 1.2C.
7. ALL INTERSECTION ACCESSES TO BE CONSTRUCTED WITH A 25 FOOT SIGHT VISIBILITY TRIANGLES AND THERE SHALL BE NO OBSTRUCTIONS GREATER THAN 18" IN THIS AREA.
8. ALL CULVERT AND STORM PIPES SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE (HDPE), OR REINFORCED CONCRETE PIPE (RCP). ALL CULVERTS SHALL BE PLACED COMPLETE WITH FLARED END SECTIONS. ADEQUACY OF MATERIAL THICKNESS FOR ANY CSP INSTALLED SHALL BE VERIFIED BY OWNERS GEOTECHNICAL ENGINEER TO SUPPORT MINIMUM 50 YEAR DESIGN LIFE. CULVERTS MUST CONFORM TO EPC ECM SECTION 3.32 – CULVERTS.
9. ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED FOR ROADS SHALL BE PER DESIGN REPORT BY OWNERS GEOTECHNICAL ENGINEER. OWNERS GEOTECHNICAL ENGINEER TO BE ON SITE AT TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION PRIOR TO CONSTRUCTION.
10. TYPE M RIP-RAP WITH 4" OF TYPE II GRANULAR BEDDING AND MIRAFI 180N OR EQUAL MAY BE SUBSTITUTED WHERE TYPE L RIP-RAP WITH MIRAFI FW 700 OR EQUAL IS SPECIFIED.
11. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN COMPLIANCE WITH ANY AND ALL APPLICABLE EL PASO COUNTY STANDARDS AND WITH WOODMAN HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
12. ALL POTABLE WATER MAINS SHALL BE AWWA C900-SDR18 PVC WITH PUSH-ON SINGLE GASKET TYPE JOINTS AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
13. ALL WATER MAIN FITTINGS SHALL BE MADE FROM GRAY-IRON OR DUCTILE IRON AND FURNISHED WITH MECHANICAL JOINT ENDS. ALL FITTINGS SHALL HAVE A PRESSURE RATING OF 250 PSI AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
14. ALL WATER LINE BENDS, TEES, BLOW-OFFS AND PLUGS AT DEAD-END MAINS SHALL BE PROTECTED FROM THRUST BY USING CONCRETE THRUST BLOCKS AND / OR RODDING AND RESTRAINED PIPE PER THE PAINT BRUSH HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
15. MAXIMUM DEFLECTION OF 8" OR 12" PVC WATER MAIN JOINTS IS 4 DEGREES. CORRESPONDING MINIMUM CURVE RADIUS IS 286'. ADDITIONAL 11.25° OR 22.5° BENDS MAY BE REQUIRED FOR PROPER ALIGNMENT.
16. CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILED AS-BUILTS OF ALL WATER MAIN, STORM SEWER AND SANITARY. SEWER MAIN INSTALLATIONS, INCLUDING ACCURATE DISTANCES OF MAIN LINES, VALVES, FITTINGS, MANHOLES AND LOCATIONS OF WATER AND SEWER SERVICES.
17. SANITARY SEWER PIPE AND FITTINGS: PVC 4" – 8" ASTM D3034, TYPE PSM, SDR 35: PUSH-ON JOINTS AND MOLDED RUBBER GASKETS MAXIMUM HORIZONTAL DEFLECTIONS, AFTER INSTALLATION AND BACK FILLING SHALL NOT EXCEED 3% OF THE PIPE DIAMETER. (MINIMUM CURVE RADIUS IS 100' FOR 8" PVC SANITARY SEWER MAIN)

STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFFSITE WATERS, INCLUDING WETLANDS.
2. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A NOTICE TO PROCEED' HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF.
5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES IS NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN PRIOR TO IMPLEMENTATION.
7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.
8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70 PERCENT OF PRE-DISTURBANCE LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.
9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME. PRE-EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A WATERS OF THE STATE, UNLESS INFEASIBLE.
11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
12. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF SITE.
13. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.
14. DEWATERING OPERATIONS: UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT MAY NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF.
15. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
16. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMPS MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
17. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
19. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
20. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
21. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCH FLOW LINE.
24. INDIVIDUALS SHALL COMPLY WITH THE 'COLORADO WATER QUALITY CONTROL ACT' (TITLE 25, ARTICLE 8, CRS), AND THE 'CLEAN WATER ACT' (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ROCKY MOUNTAIN GROUP AND SHALL BE CONSIDERED A PART OF THESE PLANS.
29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

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

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   A. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   B. CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   C. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   D. CDOT M & S STANDARDS
4. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) – INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

SIGNING AND STRIPING NOTES

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE 9" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4" UPPER-LOWER CASE LETTERING ON 8" BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6" LETTERING, UPPER-LOWER CASE ON 12" BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8" UPPER-LOWER CASE LETTERING ON 18" BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75"SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SUPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100"MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24"IN WIDTH. CROSSWALKS LINES SHALL BE 12"WIDE AND 8'LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2. LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983, THE BEARING OF THE LINE BETWEEN THE SOUTHWEST CORNER OF SECTION 1, T13S, R65W AND THE WEST QUARTER CORNER SECTION 1, T13S, R65W IS N00°13'46"W AND MONUMENTED AS SHOWN.

BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4. MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

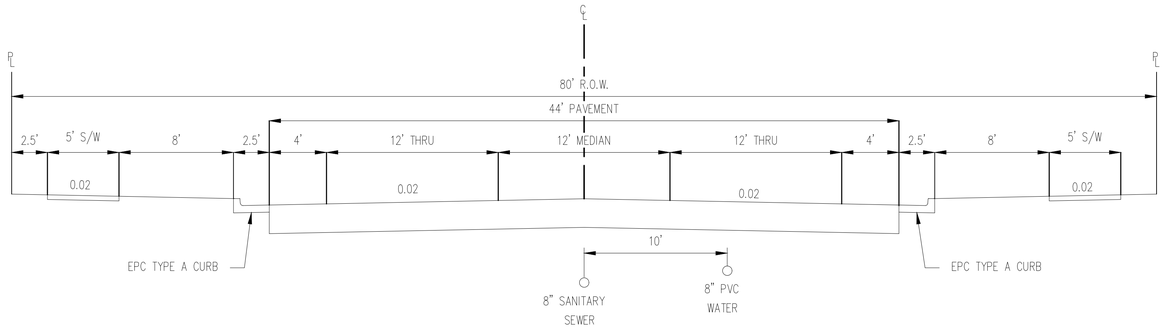
GENERAL NOTES

ASB2514

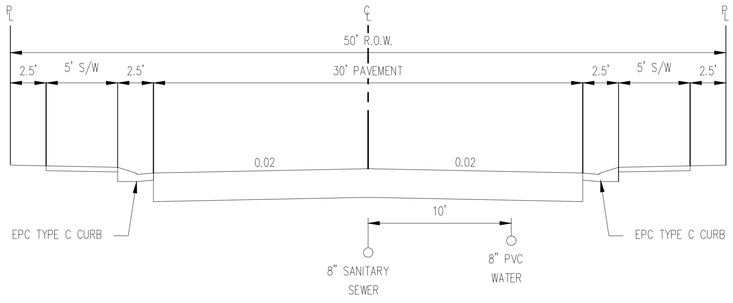
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Sheet 2 of 38

M:\Challenger Homes Inc\CO\...\El Paso County\CLH000014 Bluffwood Estates\ADMIN\CDM Files\Drawings\CLH14_00_CVs Cover Sheet.dwg, Bruce Rehbein, 3/13/2026



TYPICAL STREET SECTION – BENT GRASS MEADOWS DRIVE
URBAN NON-RESIDENTIAL COLLECTOR ROADWAY
N.T.S.



TYPICAL STREET SECTION
URBAN LOCAL ROADWAY
N.T.S.

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CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

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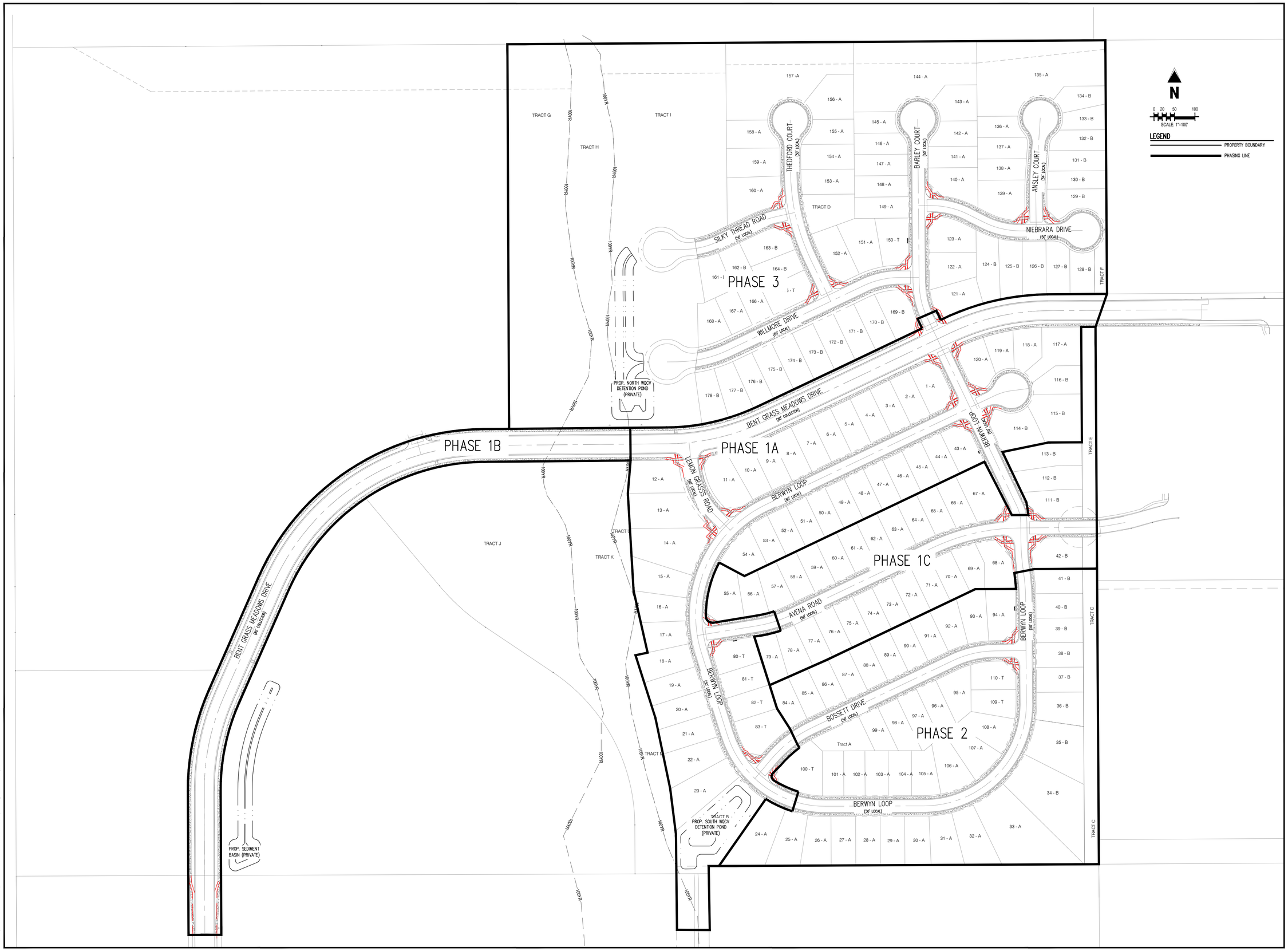
Project No:	CLH00014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

TYPICAL ROADWAY SECTIONS

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M:\Challenger Homes Inc\CO_El Paso County\CLH00014.A.Bent Grass\CAD\LT C0\El Paso County\Civil\14.28_C0Cover Sheet.dwg, Erika Nesbitt, 3/5/2026



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CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
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CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

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Project No:	CLH000014.20
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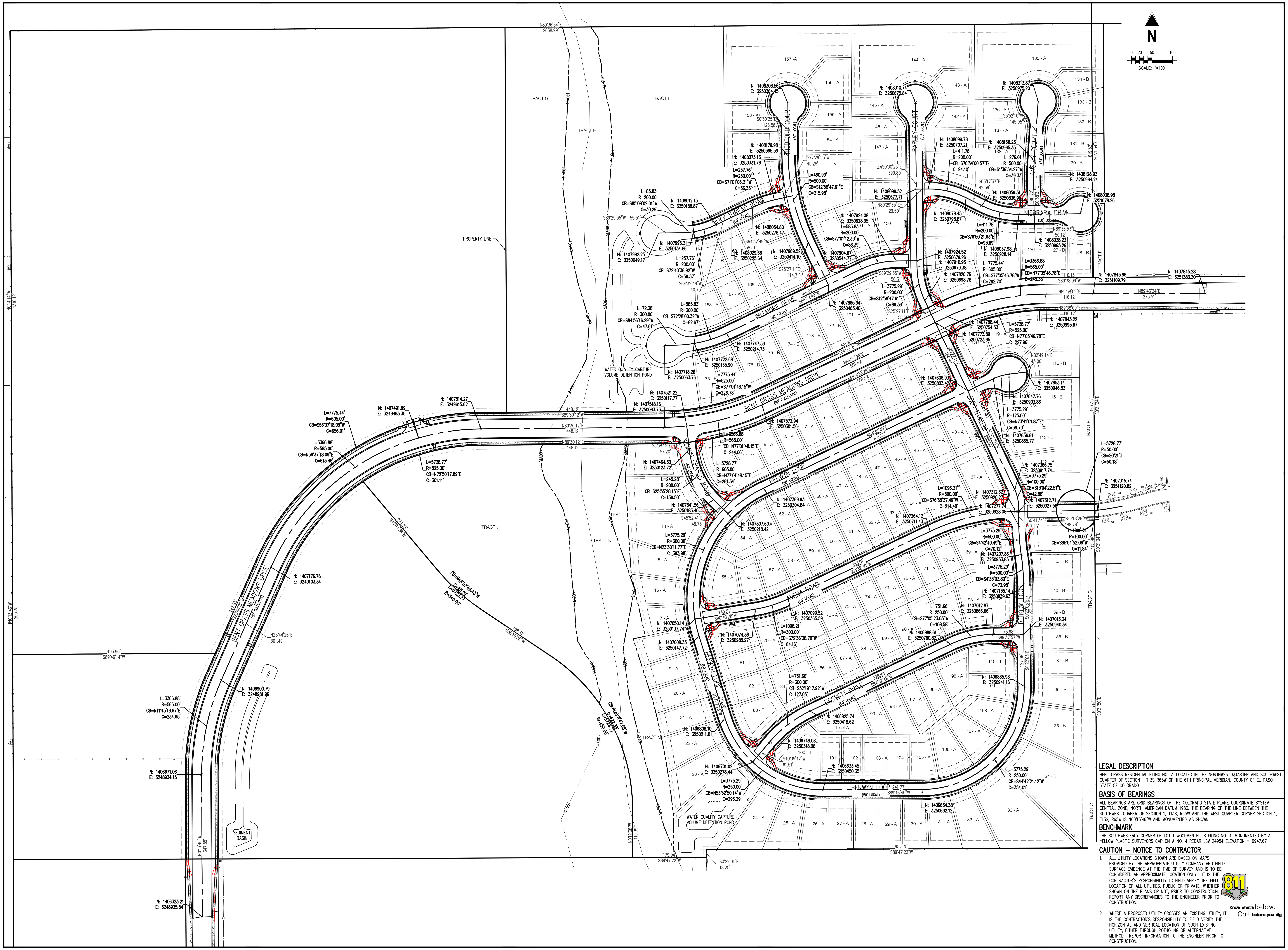
CONSTRUCTION PHASING PLAN

ASB2514

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Sheet 4 of 38

M:\Challenger Homes Inc\CO, El Paso County\CLH000014 Jeffrey\Drawing\CAD\C3 (CSM) Plans\County\CLH14.2K_C3 Cover Sheet.dwg - Evan Nelson - 3/9/2026



LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2. LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

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BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4. MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

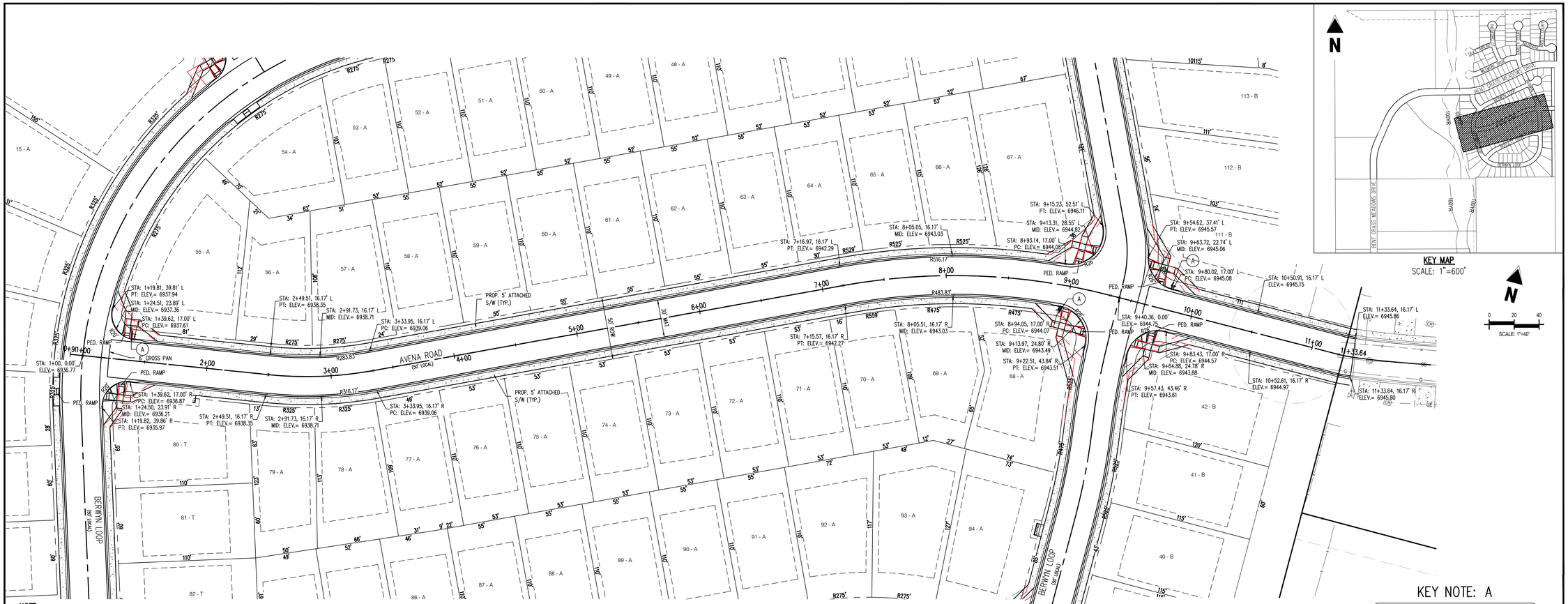
#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

OVERALL SITE PLAN

ASB2514

C1.00



KEY MAP
SCALE: 1"=600'

N
0 20 40
SCALE: 1"=40'

NOTE:
THE RADIUS CALLOUTS FOR THE ROADWAY IS TO THE FACE OF CURB, UNLESS OTHERWISE NOTED.

AVENA ROAD (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL

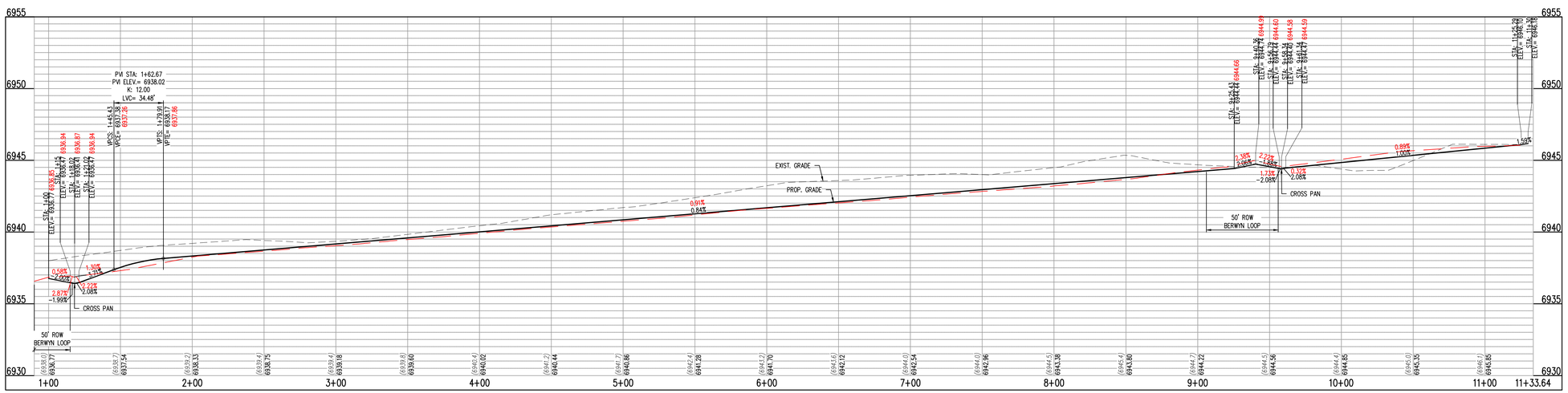
KEY NOTE: A

ROAD NAME

STREET NAME (D-3)

STOP

STOP SIGN (R1-1)



AVENA RD – CL – 50' ROW
STA: 0+90 – 11+33.64
SCALE: H: 1"=40' V: 1"=10'

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RECORD DRAWINGS

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RYAN G. DELLINGER
38164
03/16/2026
PROFESSIONAL ENGINEER

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CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

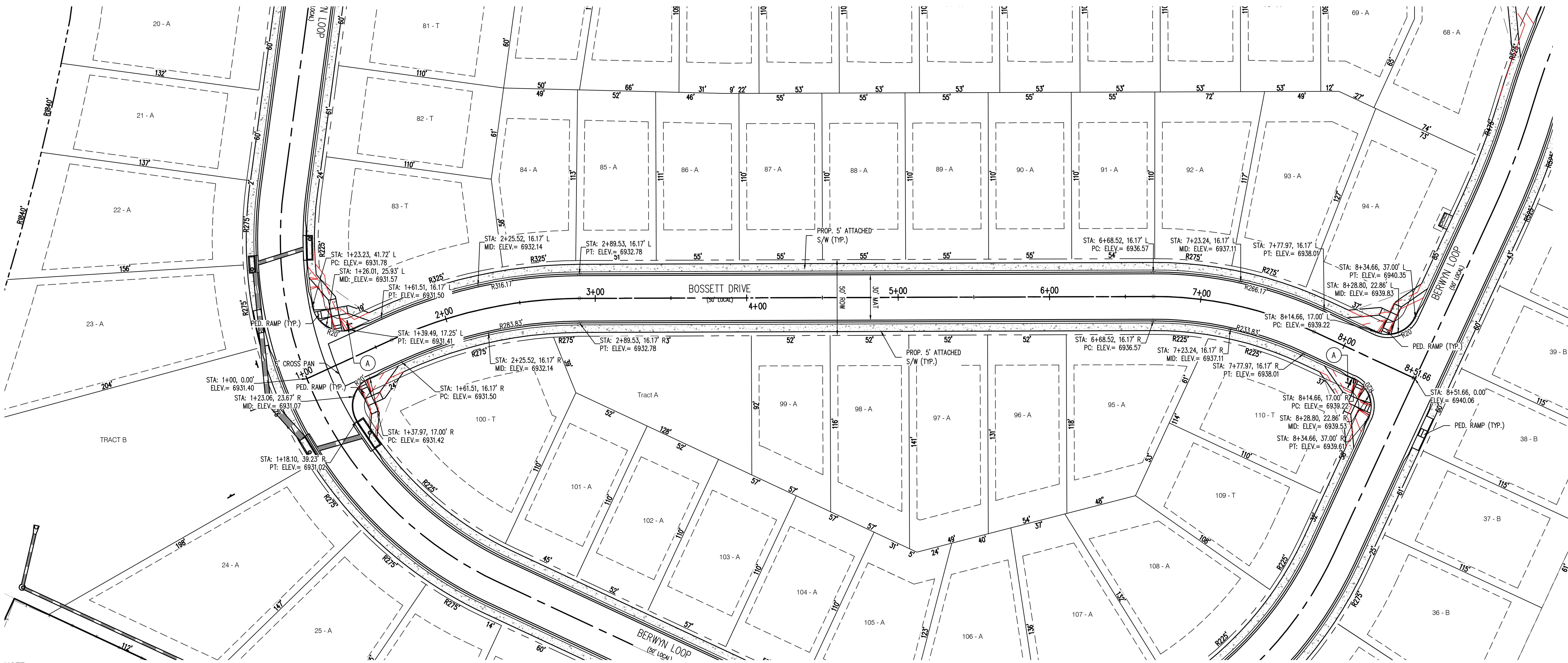
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

AVENA ROAD STREET IMPROVEMENT PLAN

ASB2514

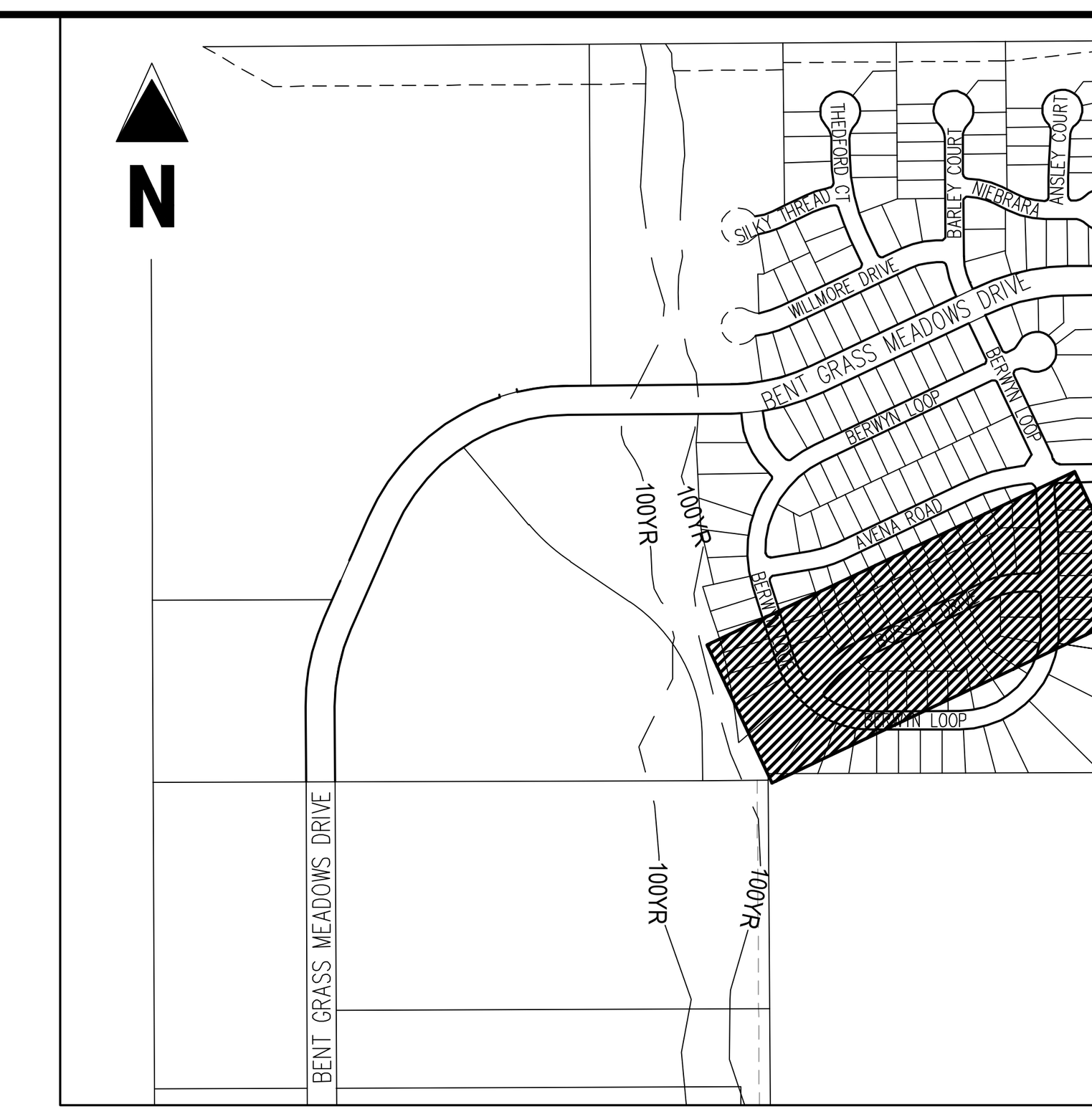
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Sheet 6 of 38

M:\Challenger Homes (HCO)\..\El Paso County\CLH000014.20\Bent Grass\CAD\C2.01 Avena & Roswell Road_ASB.dwg, Data Match, 3/5/2026



NOTE:
THE RADIUS CALLOUTS FOR THE ROADWAY IS TO THE FACE OF CURB, UNLESS OTHERWISE NOTED.

BOSSETT ROAD (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL

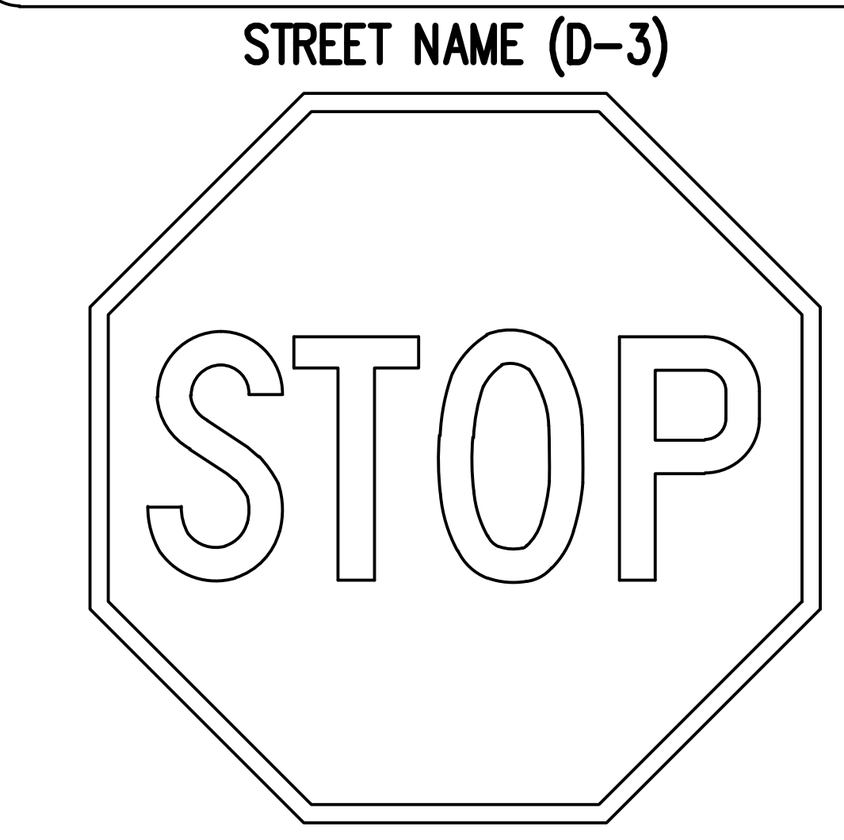


KEY MAP
SCALE: 1"=600'

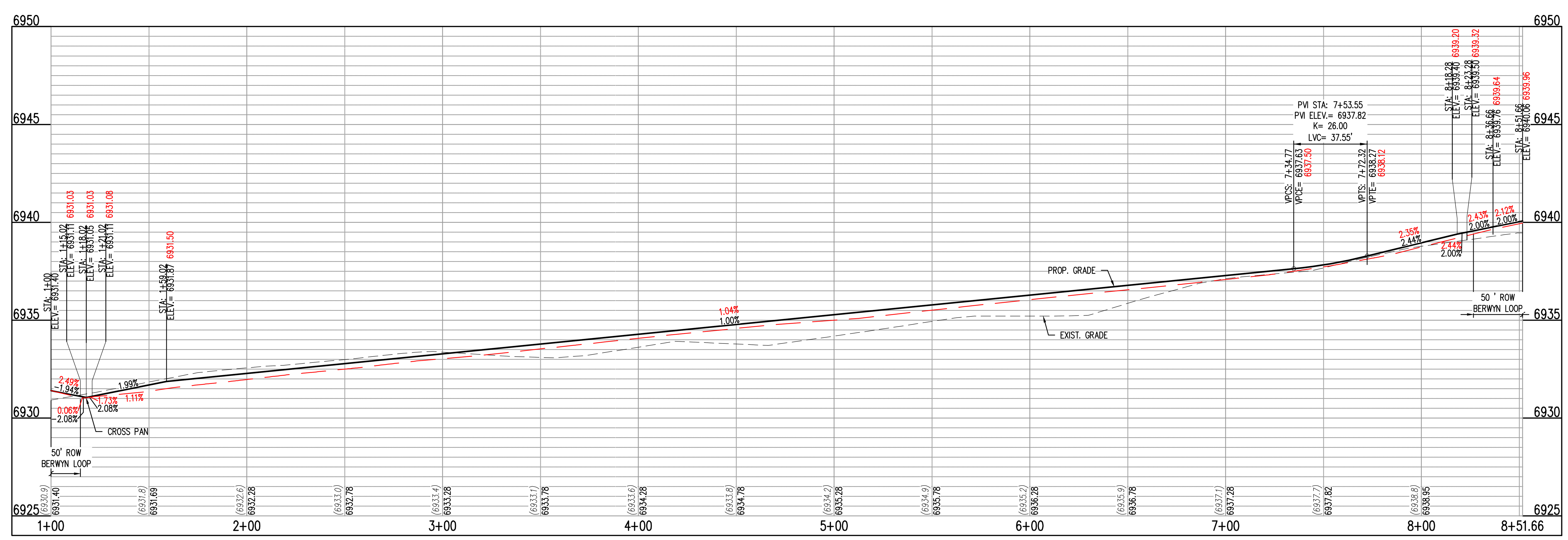
KEY NOTE: A



STREET NAME (D-3)



STOP SIGN (R1-1)



BOSSETT DR – CL – 50' ROW
STA: 1+00 – 8+51.66
SCALE: H: 1"=40' V: 1"=10'

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

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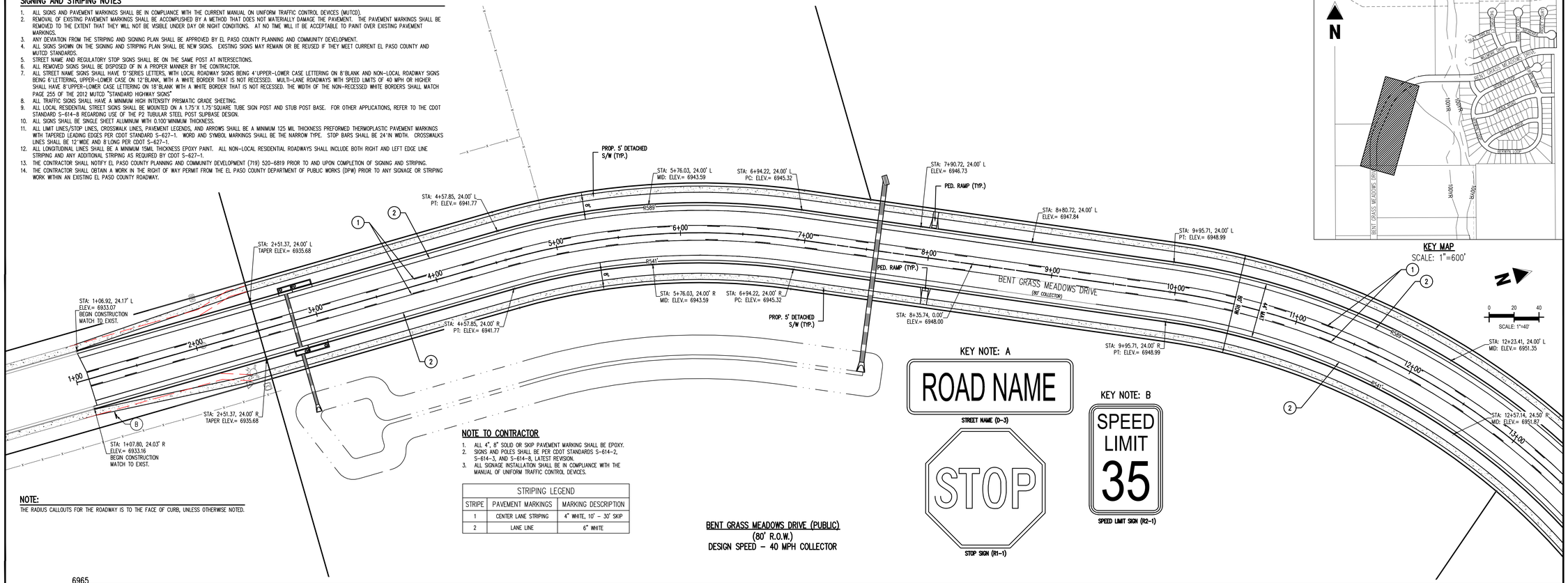
BOSSETT DRIVE STREET IMPROVEMENT PLAN

ASB2514

C2.02

SIGNING AND STRIPING NOTES

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4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE 5"SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4"UPPER-LOWER CASE LETTERING ON 8"BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6"LETTERING, UPPER-LOWER CASE ON 12"BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8"UPPER-LOWER CASE LETTERING ON 18"BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100"MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24"IN WIDTH. CROSSWALKS LINES SHALL BE 12"WIDE AND 8'LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.



KEY MAP
SCALE: 1"=600'

N
0 20 40
SCALE: 1"=40'

NOTE:
THE RADIUS CALLOUTS FOR THE ROADWAY IS TO THE FACE OF CURB, UNLESS OTHERWISE NOTED.

NOTE TO CONTRACTOR
1. ALL 4", 8" SOLID OR SKIP PAVEMENT MARKING SHALL BE EPOXY.
2. SIGNS AND POLES SHALL BE PER CDOT STANDARDS S-614-2, S-614-3, AND S-614-8, LATEST REVISION.
3. ALL SIGNAGE INSTALLATION SHALL BE IN COMPLIANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

STRIPING LEGEND		
STRIPE	PAVEMENT MARKINGS	MARKING DESCRIPTION
1	CENTER LANE STRIPING	4" WHITE, 10' – 30' SKIP
2	LANE LINE	6" WHITE

KEY NOTE: A

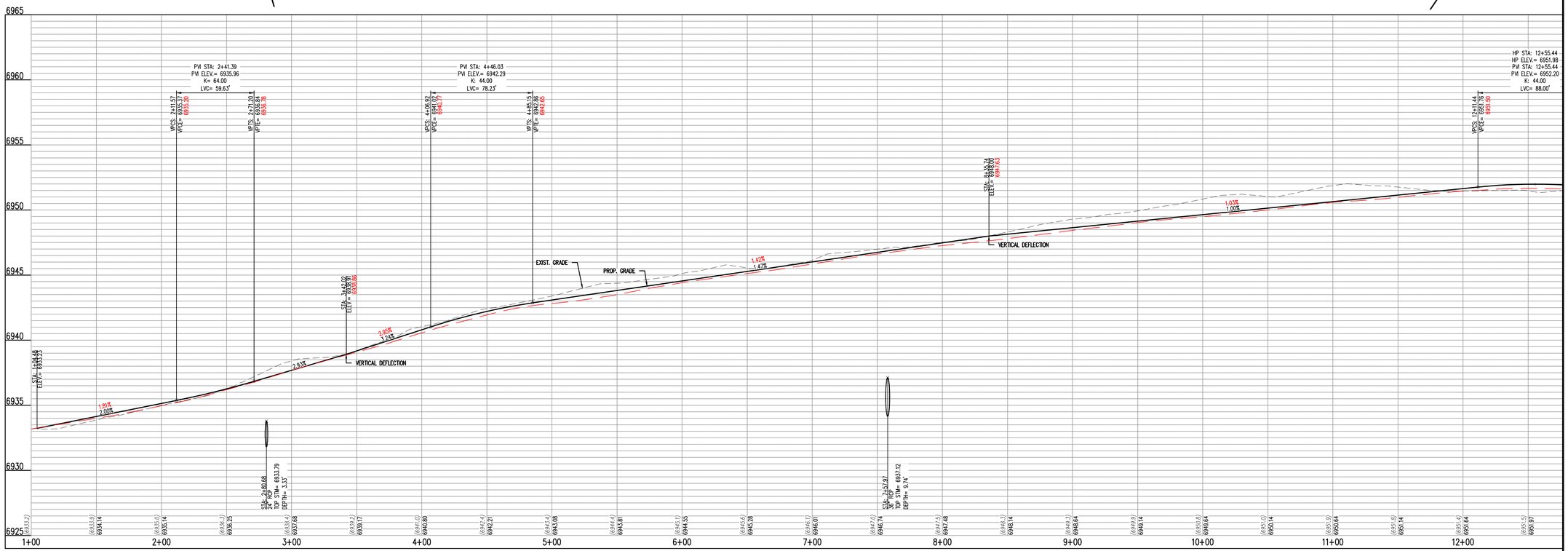
STREET NAME (D-3)

STOP SIGN (R1-1)

KEY NOTE: B

SPEED LIMIT SIGN (R2-1)

BENT GRASS MEADOWS DRIVE (PUBLIC)
(80' R.O.W.)
DESIGN SPEED – 40 MPH COLLECTOR



BENT GRASS MEADOWS DR – CL – 80' ROW
STA: 1+00 – 13+00
SCALE: H: 1"=40 V: 1"=10"

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ENGINEERING RECORD DRAWINGS

COLORADO REGISTERED PROFESSIONAL ENGINEER 38164 03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

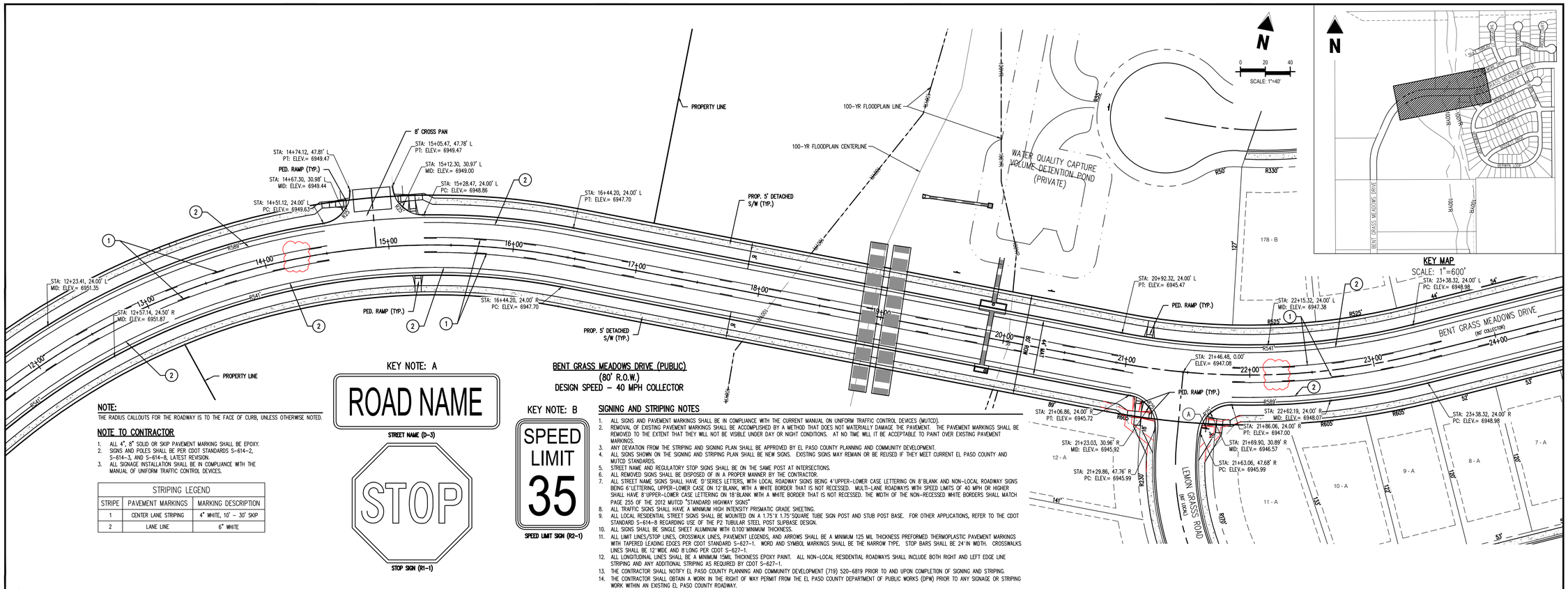
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BENT GRASS MEADOWS DRIVE STREET IMPROVEMENT PLAN

ASB2514

C2.03
Sheet 8 of 38

W:\Challenger Homes Inc\CO, El Paso County (CLH000014.20)\Bent Grass\CAD\C2.03 El Paso County (CLH14.20, Bent Grass Road, ASB Plan).dwg, Cross Section, 3/6/2026



NOTE:
THE RADIUS CALLOUTS FOR THE ROADWAY IS TO THE FACE OF CURB, UNLESS OTHERWISE NOTED.

NOTE TO CONTRACTOR

1. ALL 4", 8" SOLID OR SKIP PAVEMENT MARKING SHALL BE EPOXY.
2. SIGNS AND POLES SHALL BE PER CDOT STANDARDS S-614-2, S-614-3, AND S-614-8, LATEST REVISION.
3. ALL SIGNAGE INSTALLATION SHALL BE IN COMPLIANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

STRIPING LEGEND		
STRIPE	PAVEMENT MARKINGS	MARKING DESCRIPTION
1	CENTER LANE STRIPING	4" WHITE, 10' – 30' SKIP
2	LANE LINE	6" WHITE

KEY NOTE: A

ROAD NAME

STREET NAME (D-3)

STOP

STOP SIGN (R1-1)

KEY NOTE: B

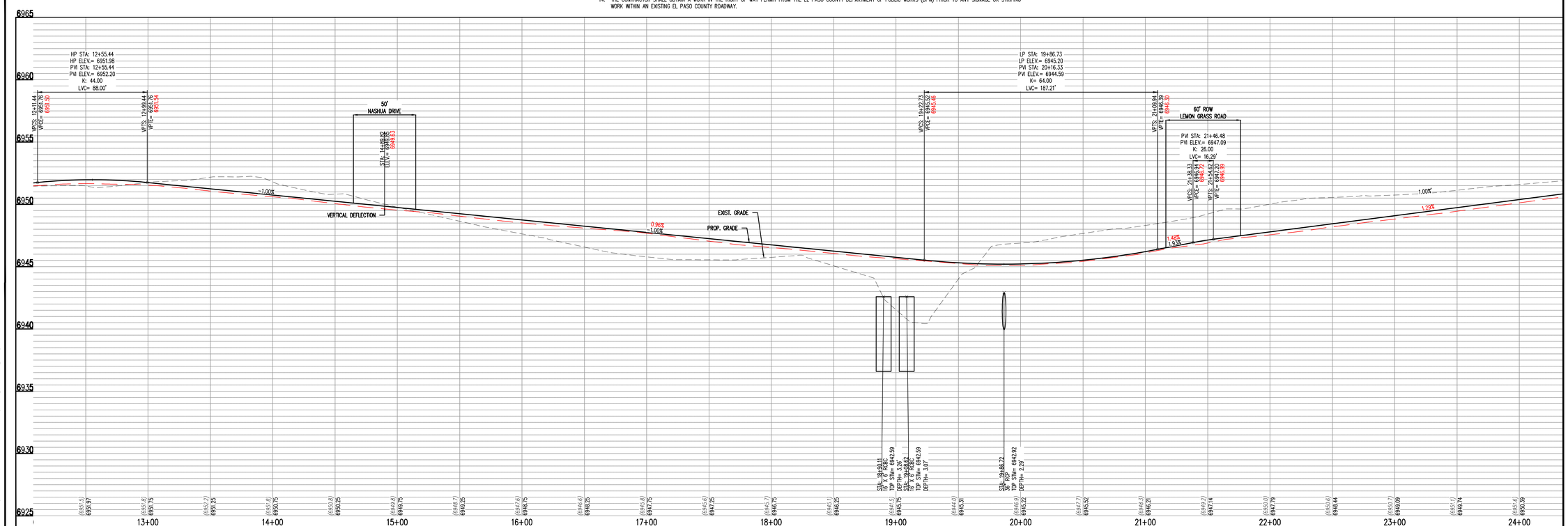
SPEED LIMIT 35

SPEED LIMIT SIGN (R2-1)

BENT GRASS MEADOWS DRIVE (PUBLIC)
(80' R.O.W.)
DESIGN SPEED – 40 MPH COLLECTOR

SIGNING AND STRIPING NOTES

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE 9" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4"UPPER-LOWER CASE LETTERING ON 8"BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6"LETTERING, UPPER-LOWER CASE ON 12"BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8"UPPER-LOWER CASE LETTERING ON 18"BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 2S5 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75"SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100"MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24'IN WIDTH. CROSSWALKS LINES SHALL BE 12'WIDE AND 8'LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.



BENT GRASS MEADOWS DR – CL – 80' ROW
STA: 13+00 – 24+00
SCALE: H: 1"=40 V: 1"=10"

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ENGINEERING RECORD DRAWINGS

COLORADO REGISTERED 38164 PROFESSIONAL ENGINEER 03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
DRIVE STREET
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BENT GRASS MEADOWS DRIVE STREET IMPROVEMENT PLAN

ASB2514

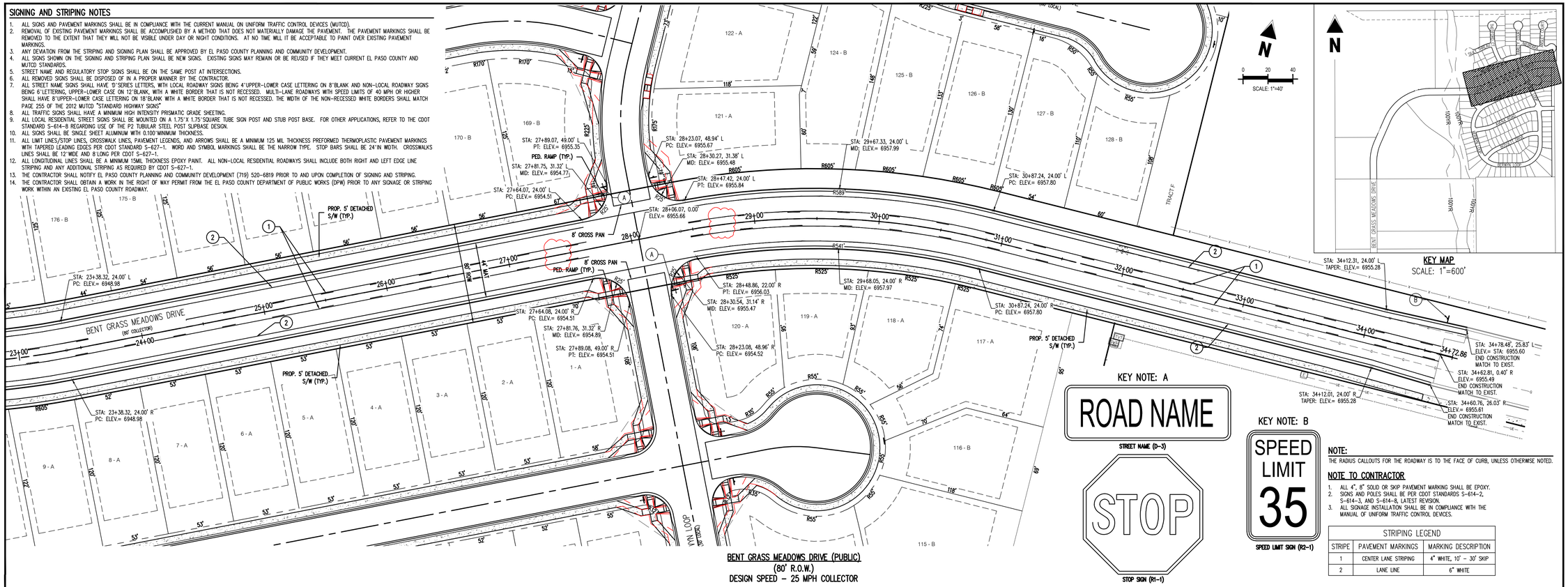
C2.04

Sheet 9 of 38

W:\Challenger Homes Inc\CO, El Paso County\CLH000014.20 Bent Grass\Civil\CAD\C2.04 Bent Grass Road, MEP.dwg, Bruce Nesbitt, 3/6/2026

SIGNING AND STRIPING NOTES

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE 'D'SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4"UPPER-LOWER CASE LETTERING ON 8"BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6"LETTERING, UPPER-LOWER CASE ON 12"BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8"UPPER-LOWER CASE LETTERING ON 18"BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75"SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100"MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24'IN WIDTH. CROSSWALKS LINES SHALL BE 12'WIDE AND 8'LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.



BENT GRASS MEADOWS DRIVE (PUBLIC)
(80' R.O.W.)
DESIGN SPEED – 25 MPH COLLECTOR

KEY NOTE: A

STREET NAME (D-3)

STOP SIGN (R1-1)

KEY NOTE: B

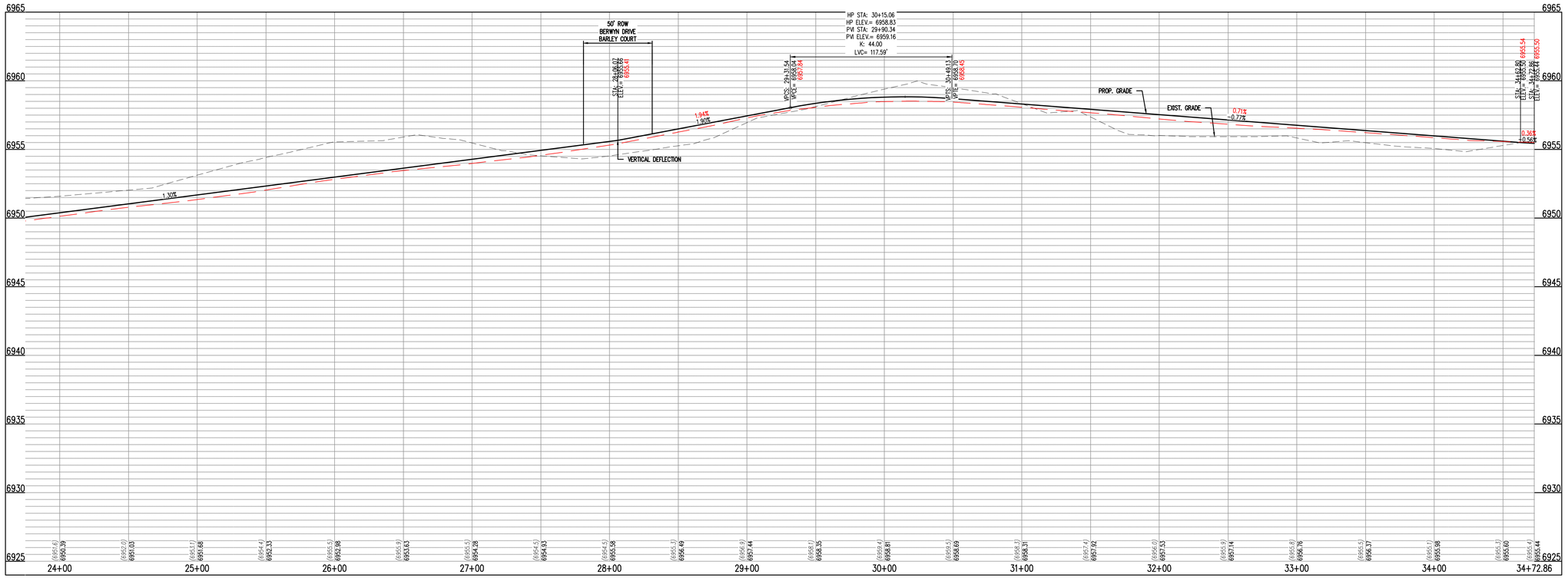
SPEED LIMIT SIGN (R2-1)

NOTE:
THE RADIUS CALLOUTS FOR THE ROADWAY IS TO THE FACE OF CURB, UNLESS OTHERWISE NOTED.

NOTE TO CONTRACTOR

1. ALL 4", 8" SOLID OR SKIP PAVEMENT MARKING SHALL BE EPOXY.
2. SIGNS AND POLES SHALL BE PER CDOT STANDARDS S-614-2, S-614-3, AND S-614-8, LATEST REVISION.
3. ALL SIGNAGE INSTALLATION SHALL BE IN COMPLIANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

STRIPING LEGEND		
STRIPE	PAVEMENT MARKINGS	MARKING DESCRIPTION
1	CENTER LANE STRIPING	4" WHITE, 10' – 30' SKIP
2	LANE LINE	6" WHITE



BENT GRASS MEADOWS DR – CL – 80' ROW
STA: 24+00 – 34+72.86
SCALE: H: 1"=40 V: 1"=10"

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COLORADO REGISTERED 38164 PROFESSIONAL ENGINEER
03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

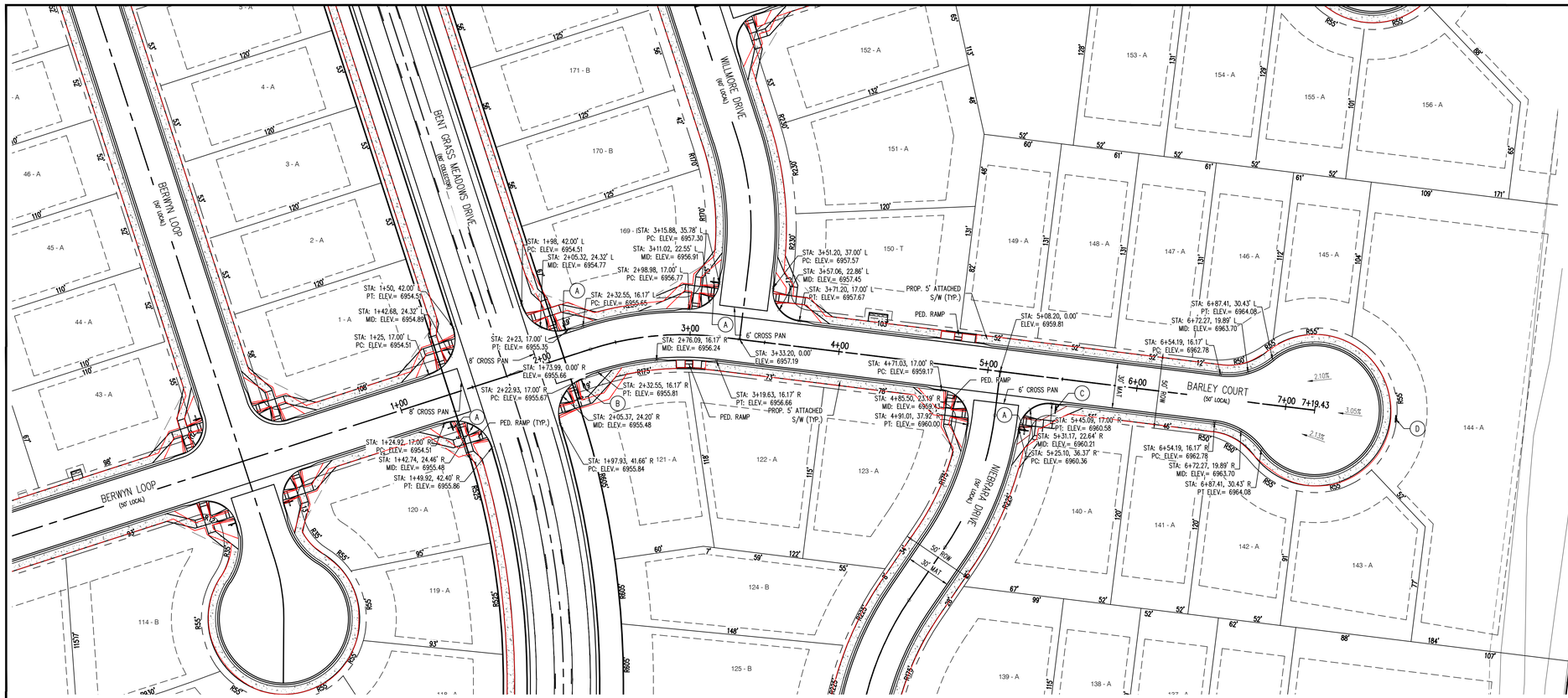
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BENT GRASS MEADOWS DRIVE STREET IMPROVEMENT PLAN

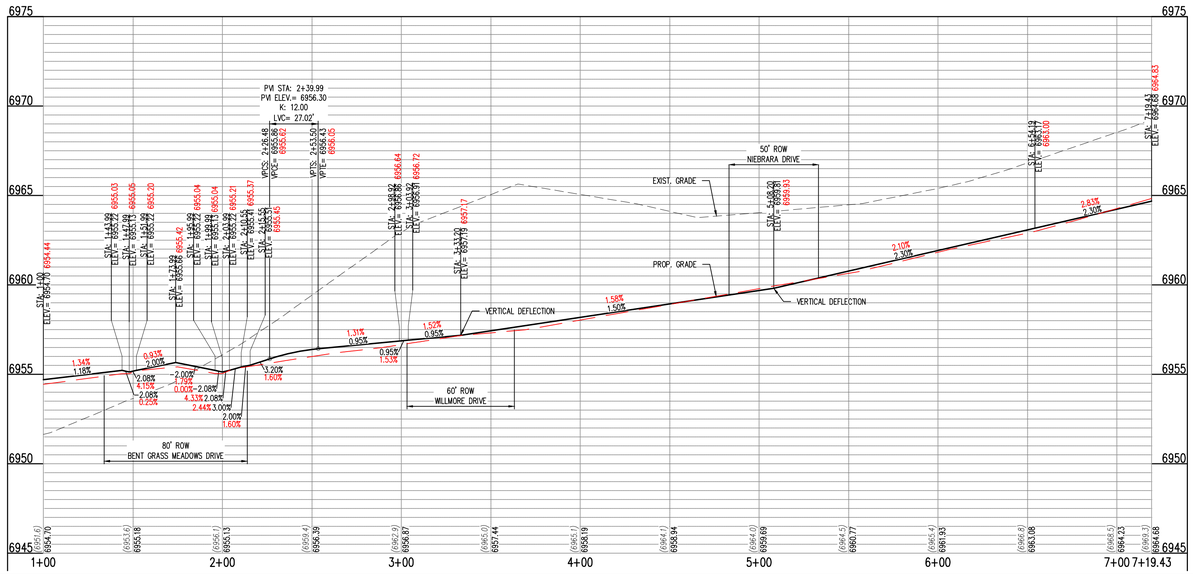
ASB2514

C2.05
Sheet 10 of 38

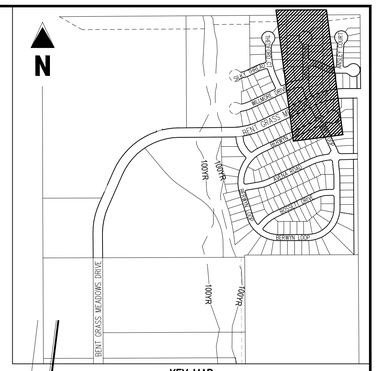
M:\2\Challenger Homes Inc\003. El Paso County\CLH000014.20\Bent Grass\CAD\12-CIVIL\Bent Grass Road_PAP.dwg - Sara Nesbitt - 3/5/2026



BARLEY COURT (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



BARLEY COURT – CL – 50' ROW
STA: 1+00 – 7+19.43
SCALE: H: 1"=40' V: 1"=10'



KEY MAP
SCALE: 1"=600'

SCALE: 1"=40'

KEY NOTE: A

ROAD NAME

STREET NAME (D–3)

STOP

STOP SIGN (R1–1)

BLACK STRIPE
YELLOW SIGN
BLACK LETTERING

NO OUTLET

NO OUTLET SIGN (W14–2)

KEY NOTE: B

BLACK STRIPE
YELLOW SIGN
BLACK LETTERING

DEAD END

DEAD END SIGN (W14–1)

KEY NOTE: C

RED SIGN
RED REFLECTORS (TYP.)

TYPE 4 OBJECT MARKER

KEY NOTE: D

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RYAN G. DEVORE
38164
03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

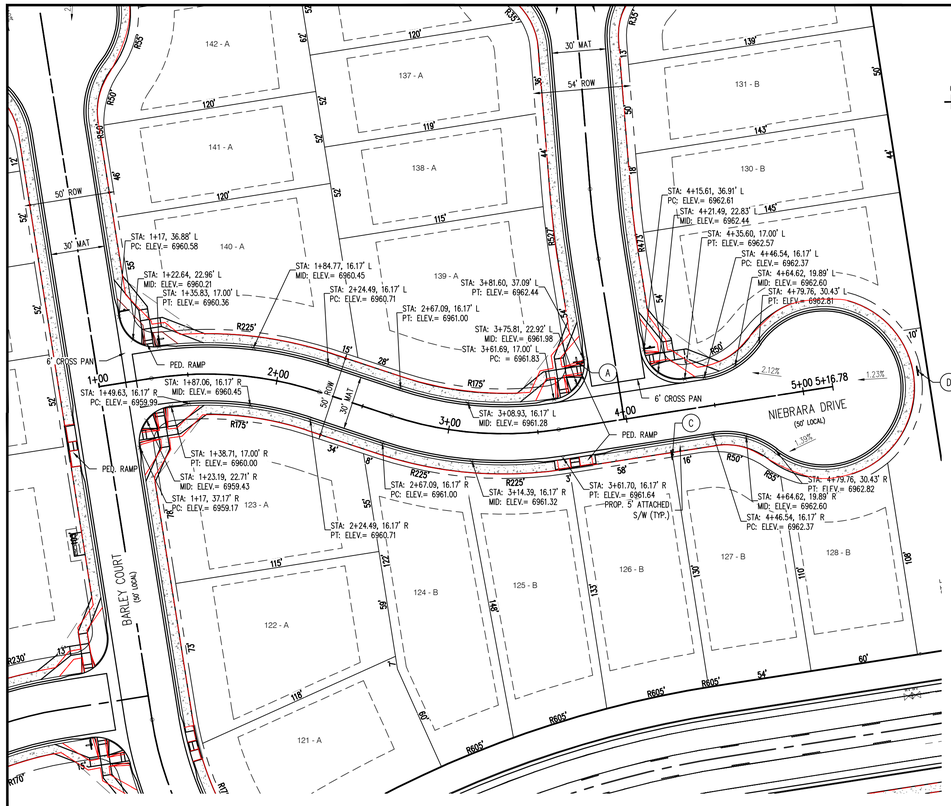
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BARLEY COURT STREET IMPROVEMENT PLAN

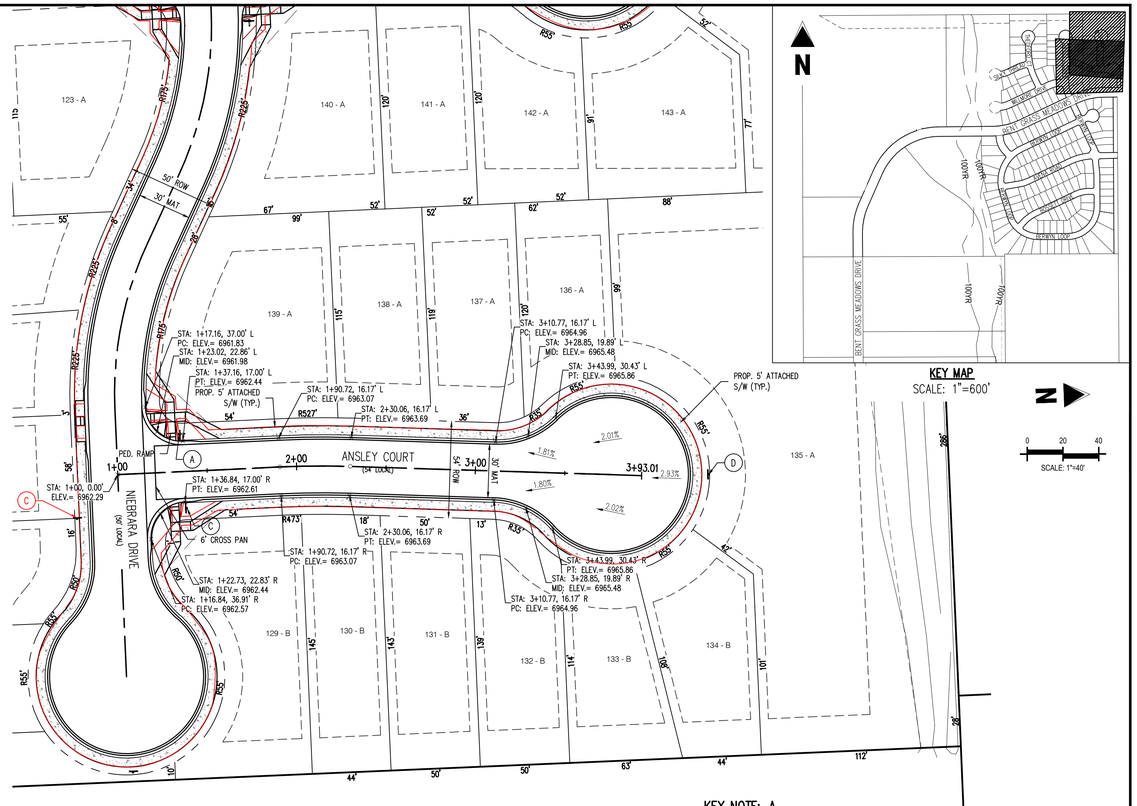
ASB2514

C2.06
Sheet 11 of 38

H:\Challenger Homes Inc\CO - El Paso County\CLH000014.20 Bent Grass\Civil\CAD\13 CDS\1 Bent Grass\CAD\13 CDS\1 Bent Grass Arterial.dwg, Rev Model - 3/5/2026



NIEBRARA DRIVE (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



ANSLEY COURT (PUBLIC)
(54' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL

KEY NOTE: A

STREET NAME (D-3)

STOP SIGN (R1-1)

NO OUTLET SIGN (W14-2)

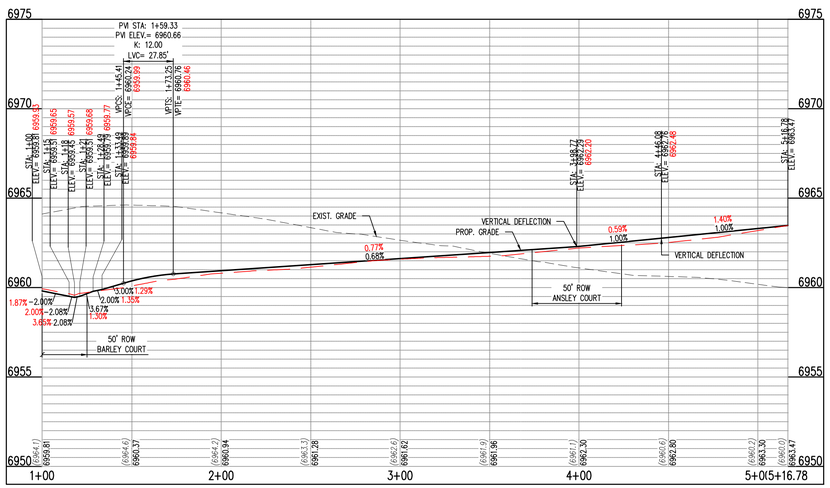
KEY NOTE: B

DEAD END SIGN (W14-1)

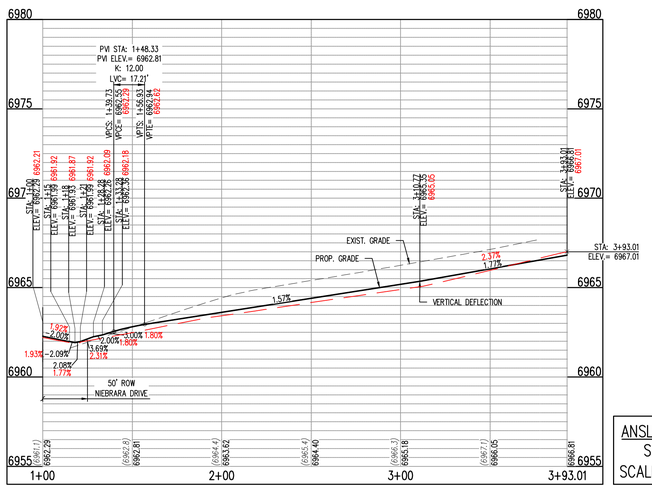
KEY NOTE: C

TYPE 4 OBJECT MARKER

KEY NOTE: D



NIEBRARA – CL – 50' ROW
STA: 1+00 – 5+16.78
SCALE: H: 1"=40' V: 1"=10'



ANSLEY CT – CL – 50' ROW
STA: 1+00 – 3+93.01
SCALE: H: 1"=40' V: 1"=10'

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

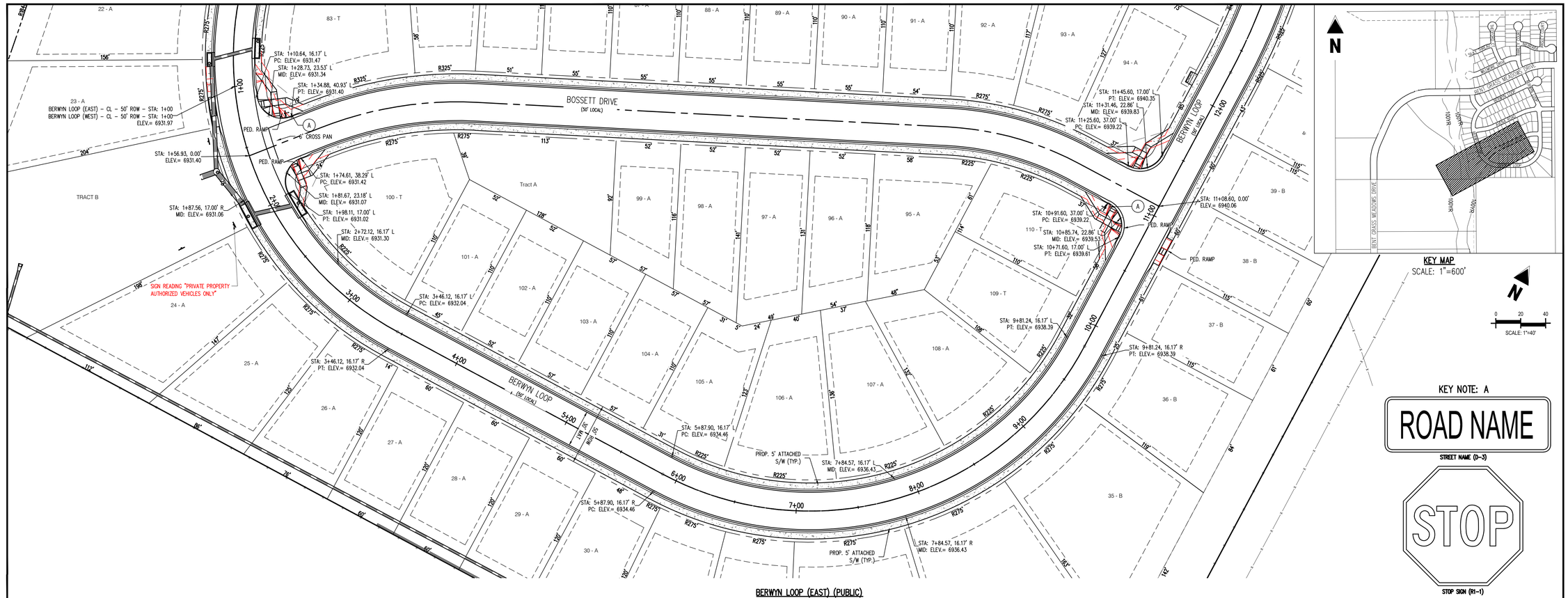
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

NIEBRARA DRIVE &
ANSLEY COURT STREET
IMPROVEMENT PLAN

ASB2514

C2.07
Sheet 12 of 38

M:\Challenger Homes Inc\2023...\El Paso County\CLH000014.20\Bent Grass\CAD\C2.07.dwg, Bent Grass Meadows Drive & Meridian Road, 3/6/2026 8:36:...



KEY MAP
SCALE: 1"=600'

N

0 20 40
SCALE: 1"=40'

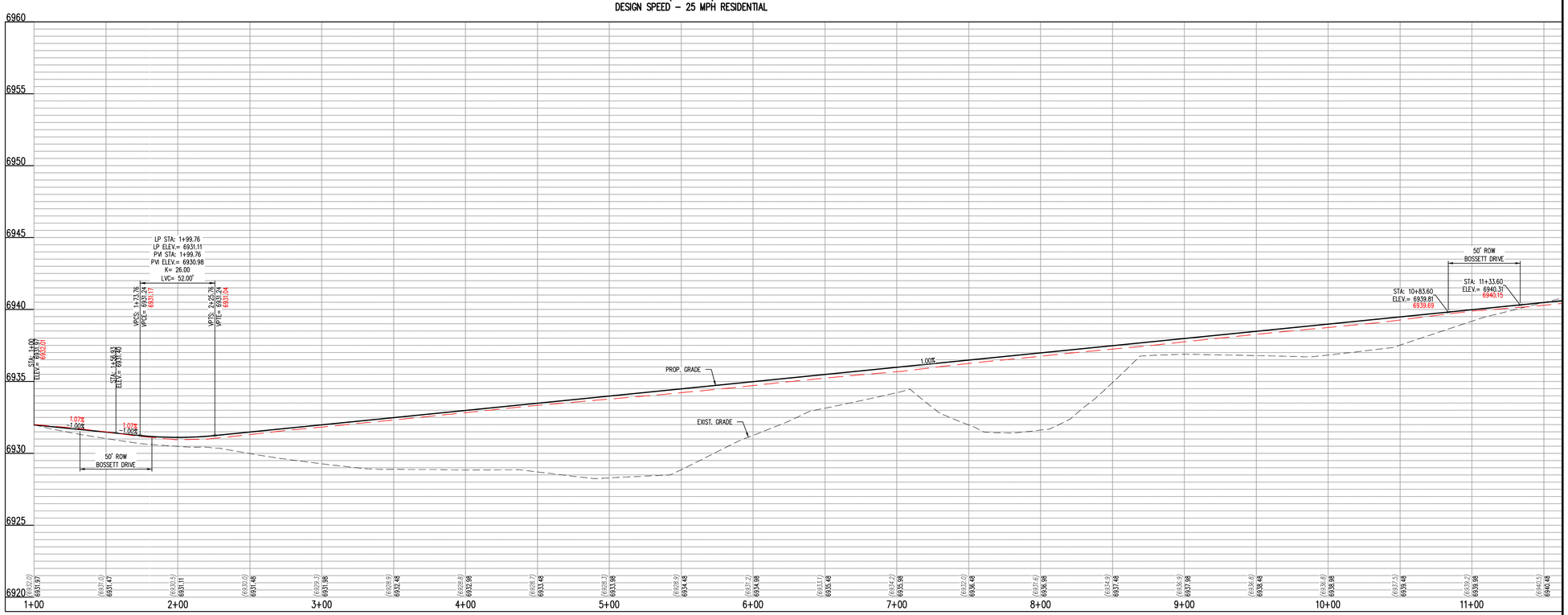
KEY NOTE: A

ROAD NAME

STREET NAME (D-3)

STOP SIGN (R1-1)

BERWYN LOOP (EAST) (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



BERWYN LOOP (EAST) – CL – 50' ROW
STA: 1+00 – 11+50
SCALE: H: 1"=40 V: 1"=10"

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38164
03/16/2026
PROFESSIONAL ENGINEER

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

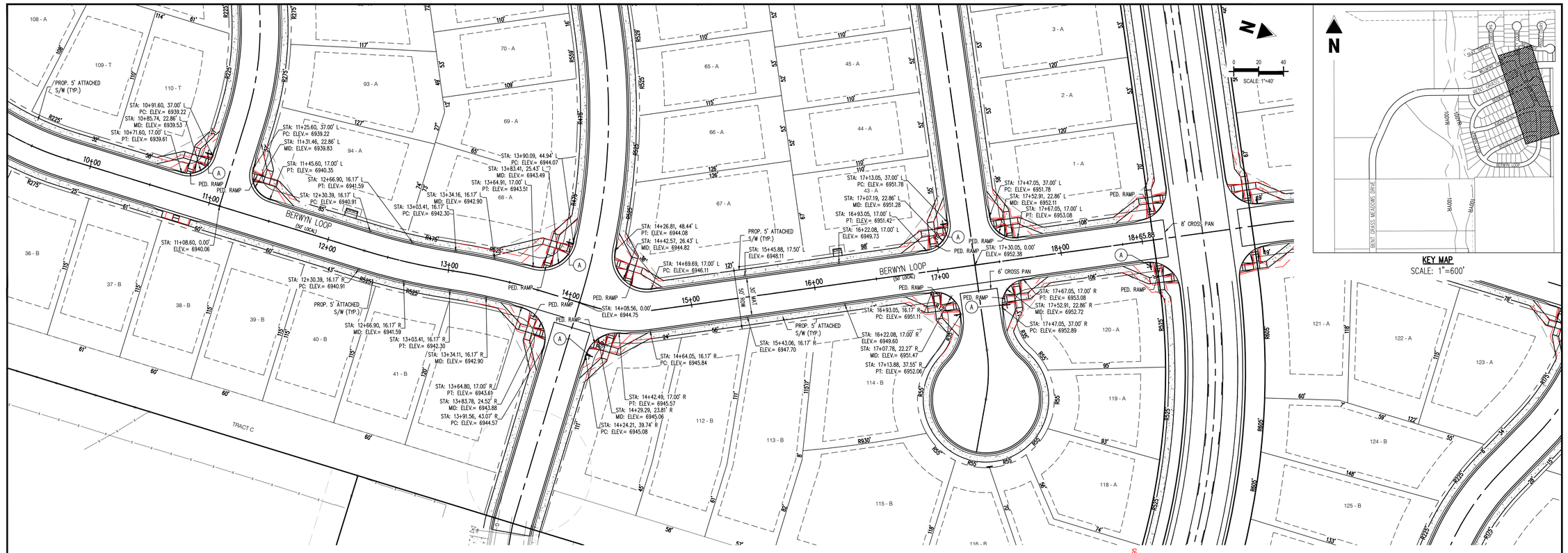
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BERWYN LOOP (EAST)
STREET IMPROVEMENT
PLAN

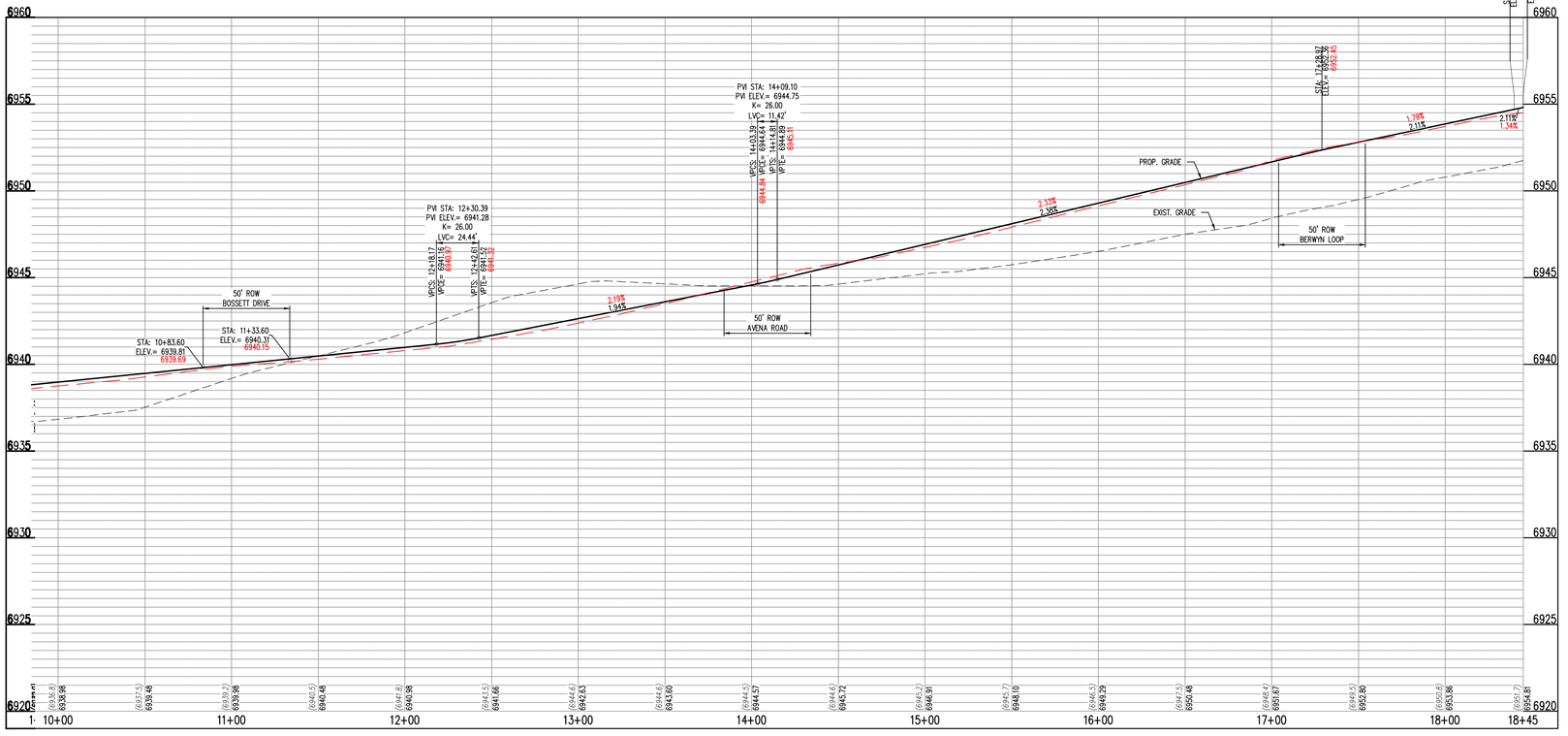
ASB2514

C2.08
Sheet 13 of 38

M:\Challenger Homes Inc\CO, El Paso County\CLH000014 Jeffrey\Civil\CAD\C1 COVER Sheet Counts\CLH14.2d_Counts Name Cover.dwg\PDF Map - Bent Notch - 3/9/2026



BERWYN LOOP (EAST) (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



BERWYN LOOP (EAST) – CL – 50' ROW
STA: 10+00 – 18+45
SCALE: H: 1"=40 V: 1"=10"

KEY NOTE: A



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CHALLENGER HOMES

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BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

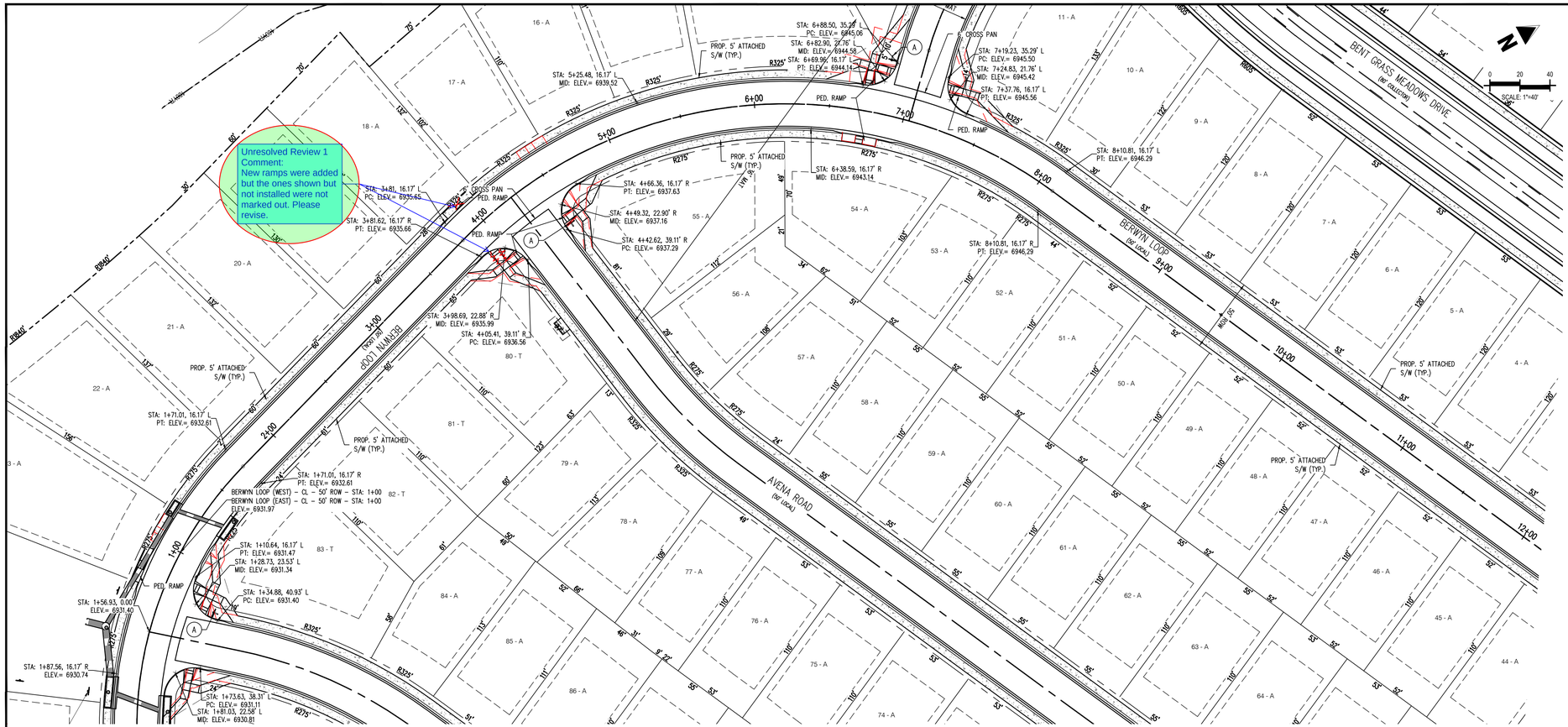
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

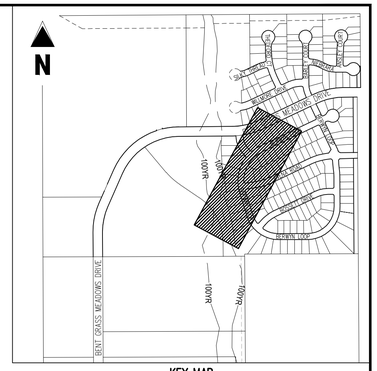
BERWYN LOOP (EAST)
STREET IMPROVEMENT PLAN

ASB2514

C2.09
Sheet 14 of 38

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KEY MAP
SCALE: 1"=600'

KEY NOTE: A

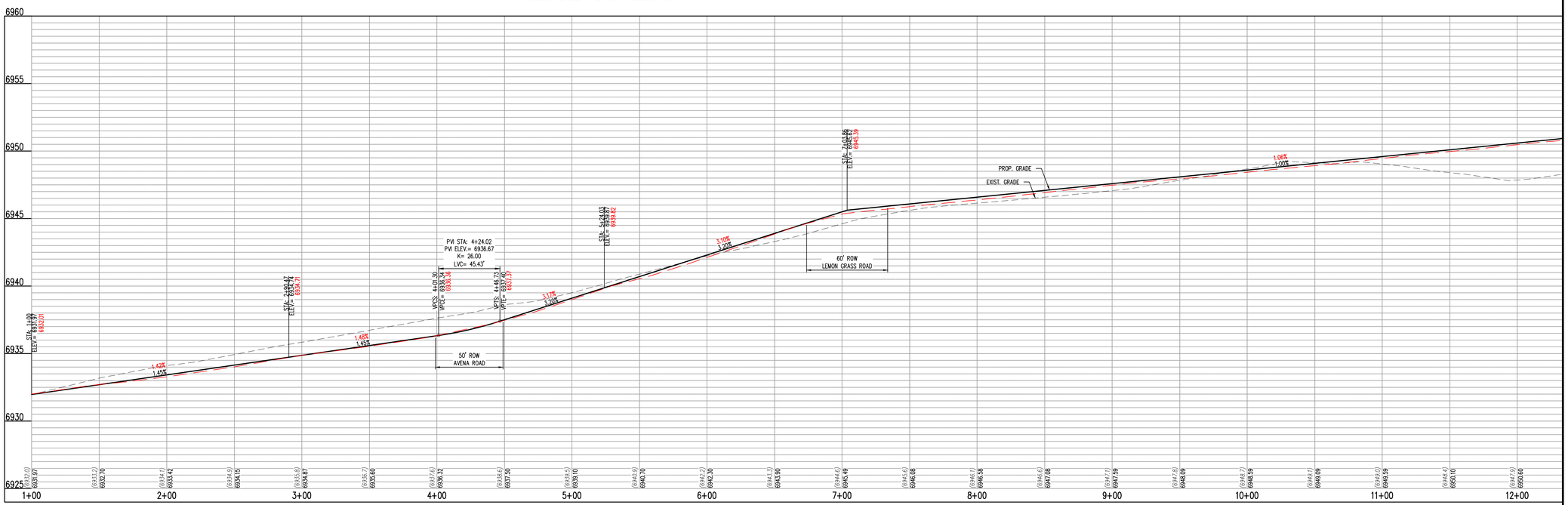
ROAD NAME

STREET NAME (0-3)

STOP

STOP SIGN (R1-1)

BERWYN LOOP (WEST) (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



BERWYN LOOP (WEST) – CL – 50' ROW
STA: 10+00 – 18+45
SCALE: H: 1"=40 V: 1"=10"

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03/16/2026

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CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

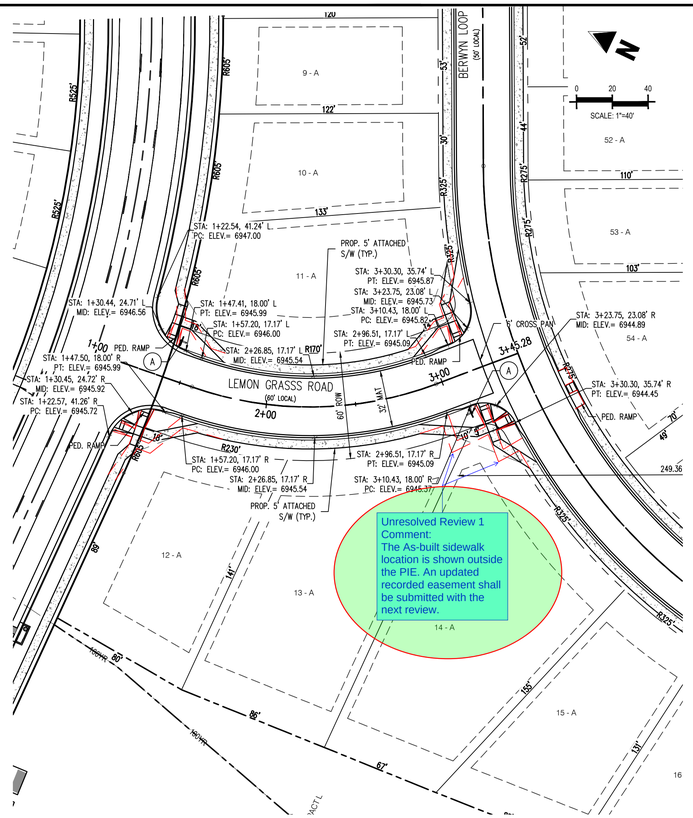
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BERWYN LOOP (WEST)
STREET IMPROVEMENT
PLAN

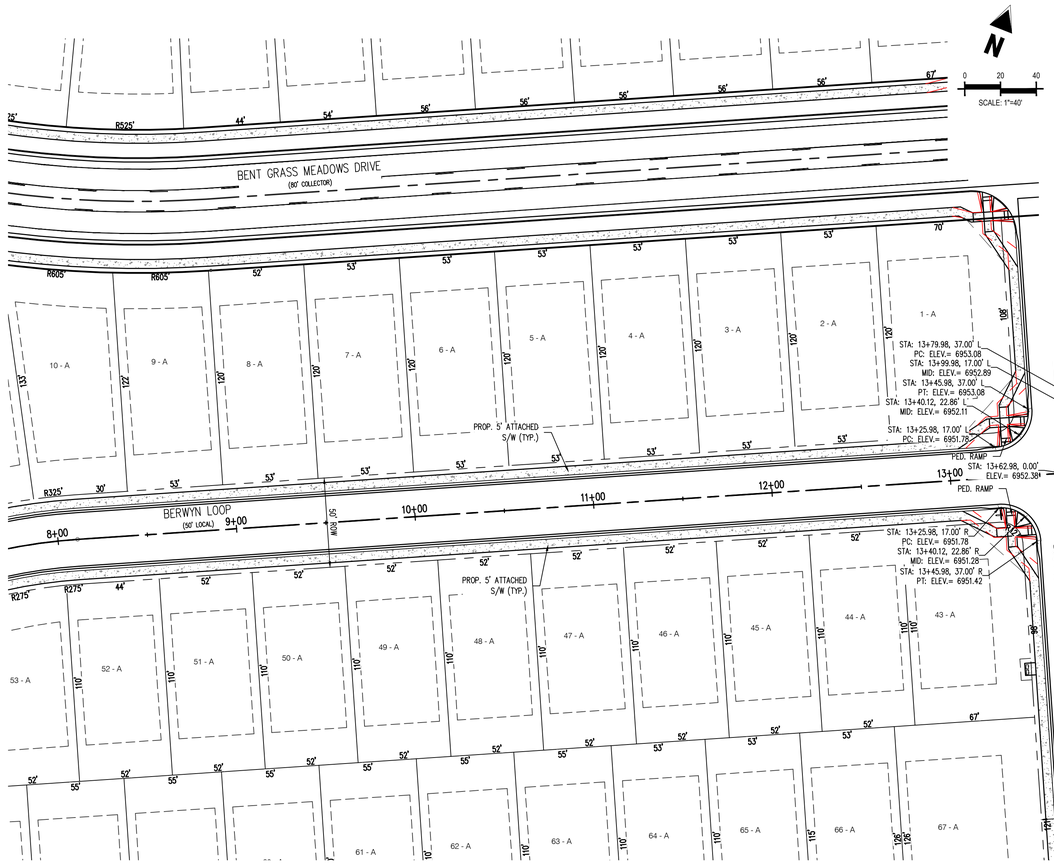
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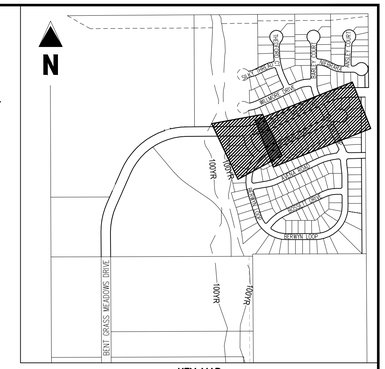
C2.10
Sheet 15 of 38

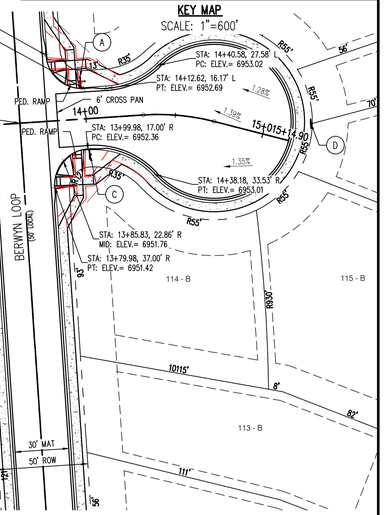
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LEMON GRASS ROAD (PUBLIC)
(60' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



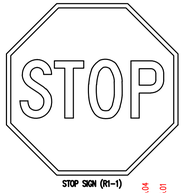




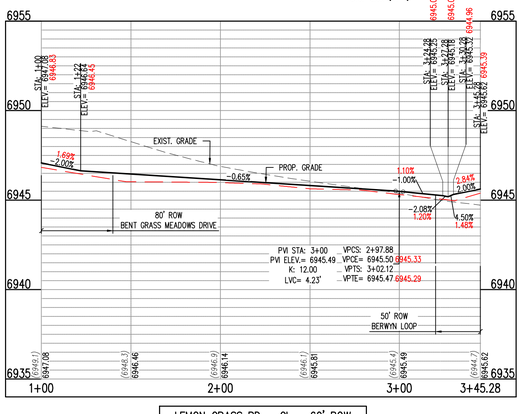
KEY NOTE: A



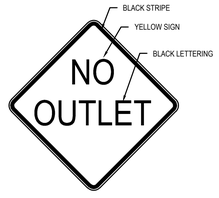
STREET NAME (D-3)



STOP SIGN (R1-1)

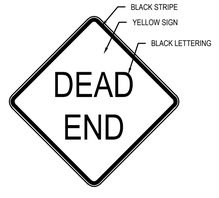


LEMON GRASS RD – CL – 60' ROW
STA: 1+00 – 3+45.28
SCALE: H: 1"=40 V: 1"=10"



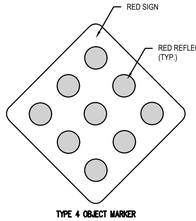
NO OUTLET SIGN (W14-2)

KEY NOTE: B



DEAD END SIGN (W14-1)

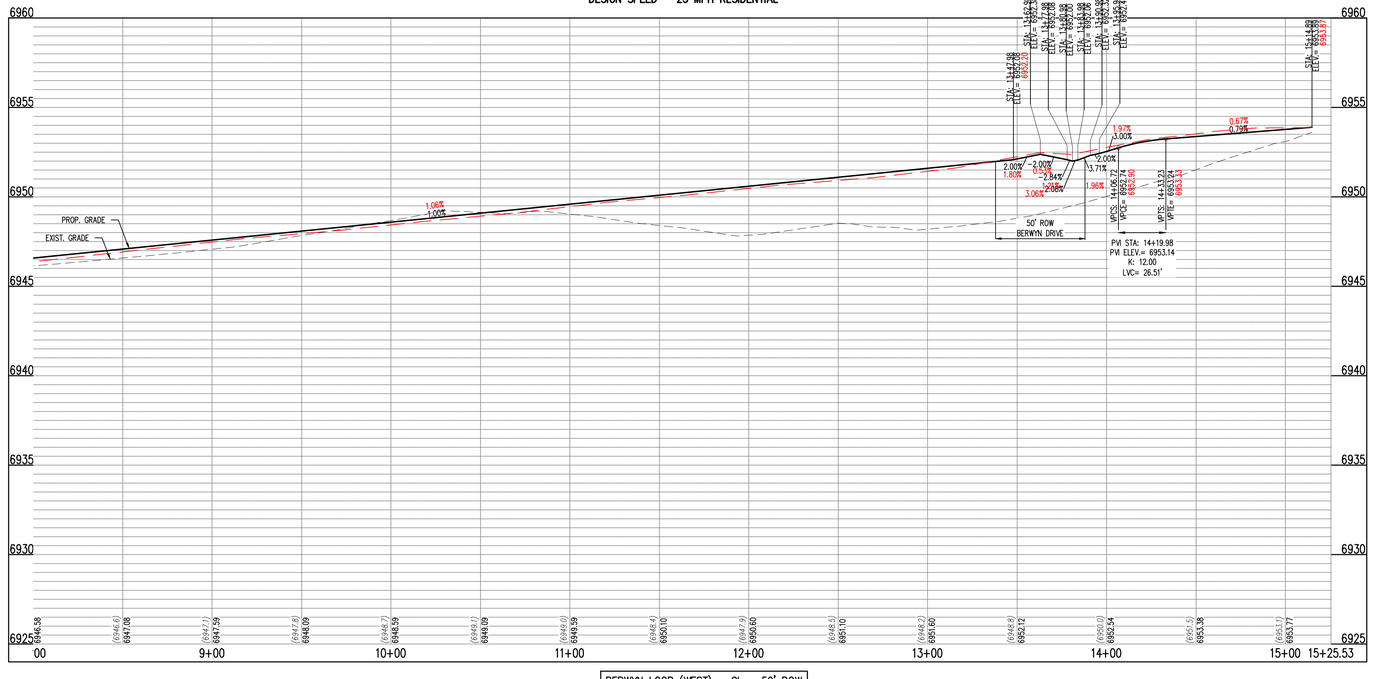
KEY NOTE: C



TYPE 4 OBJECT MARKER

KEY NOTE: D

SILVER GRASS ROAD (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



BERWYN LOOP (WEST) – CL – 50' ROW
STA: 10+00 – 15+25.53
SCALE: H: 1"=40 V: 1"=10"

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

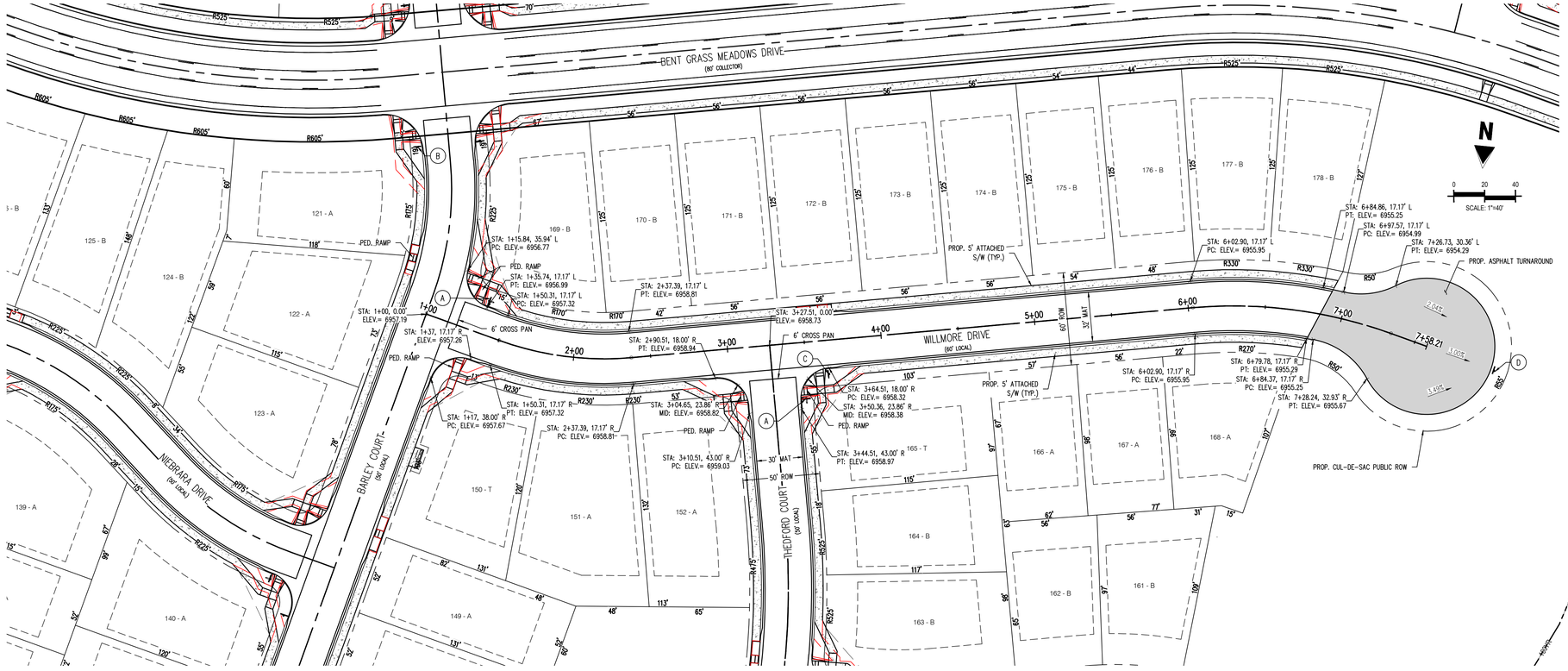
#	Date	Issue / Description	Init.

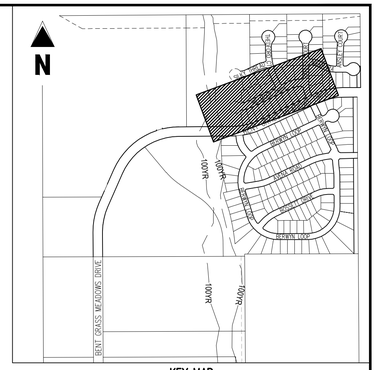
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BERWYN LOOP (WEST) &
LEMONGRASS ROAD
STREET IMPROVEMENT
PLAN
ASB2514

C2.11
Sheet 16 of 38

M:\Challenger Homes Inc\CO_El Paso County\CLH000014_Bent Grass\Civil\CAD\C3 (CSE) Sheet Civil\CLH14.1_Bent Grass Filing 2 Landing.dwg, 3/13/2026





KEY MAP
SCALE: 1"=600'

KEY NOTE: A



STREET NAME (D-3)

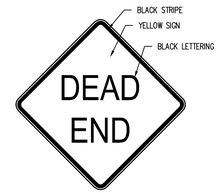


STOP SIGN (R1-1)



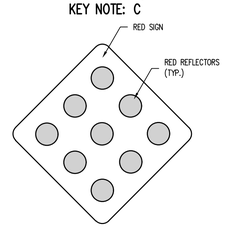
NO OUTLET SIGN (W14-2)

KEY NOTE: B



DEAD END SIGN (W14-1)

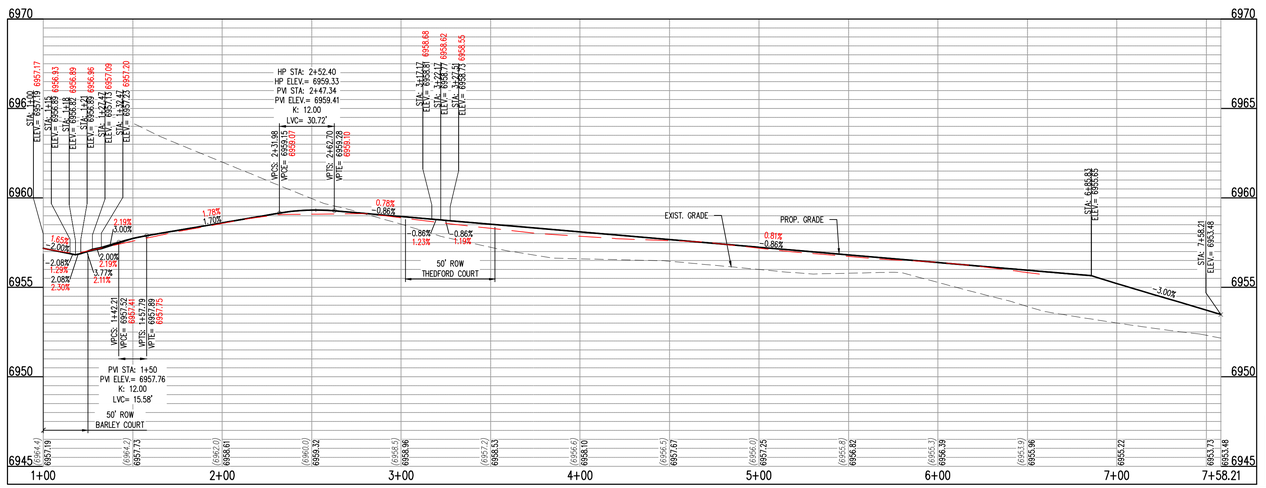
KEY NOTE: C



TYPE 4 OBJECT MARKER

KEY NOTE: D

WILMORE DRIVE (PUBLIC)
(60' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



WILLMORE DR EAST – CL – 60' ROW
STA: 1+00 – 7+58.21
SCALE: H: 1"=40' V: 1"=10'

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38164
03/16/2026
PROFESSIONAL ENGINEER

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BENT GRASS RESIDENTIAL FILING NO. 2
FOR
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BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

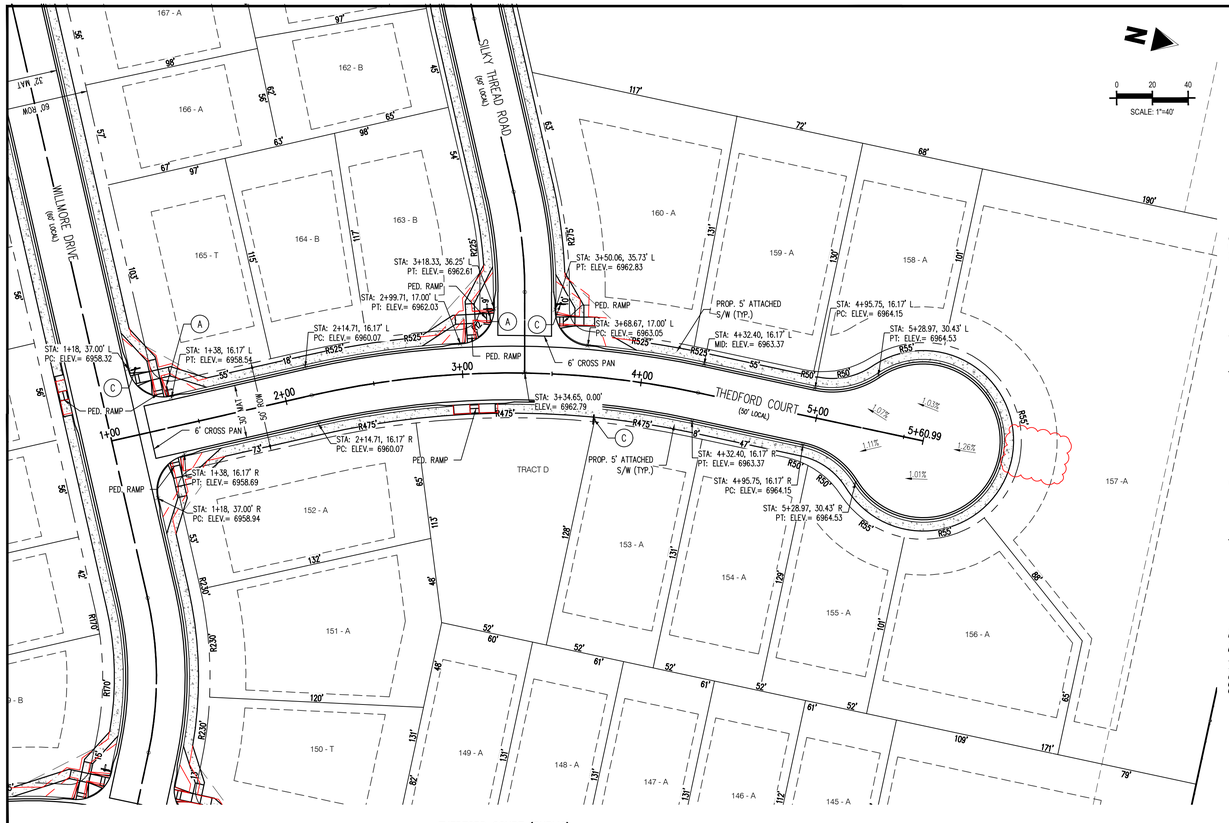
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

WILLMORE DRIVE STREET IMPROVEMENT PLAN

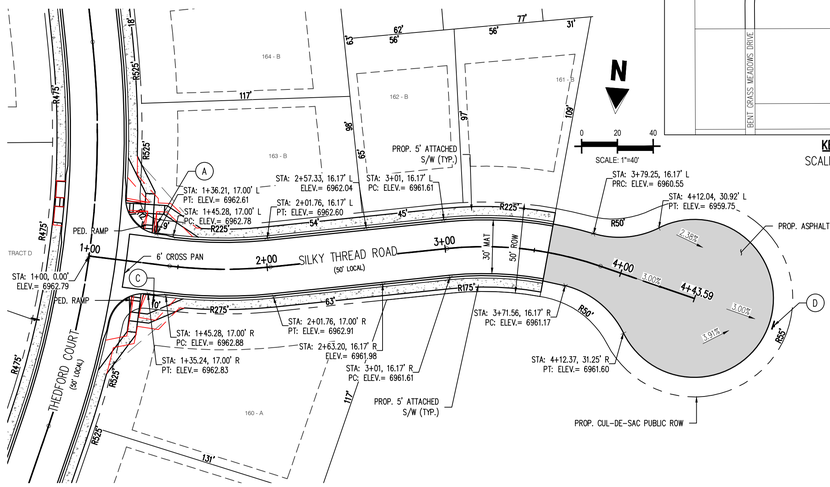
ASB2514

C2.12
Sheet 17 of 38

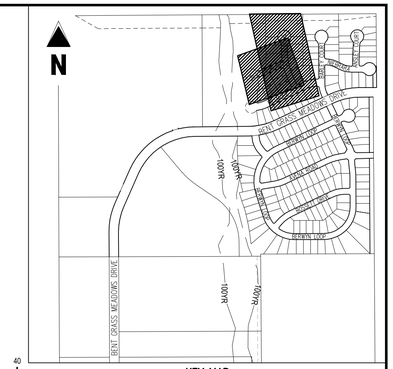
H:\Challenger Homes Inc\CO - El Paso County\CLH000014.20\Bent Grass\Civil\CAD\12 CDSS Bent Grass\Civil\CLH14_05_WILLPlanSet.dwg [PDF Plan - Bent Grass] - 3/13/2026



THEDFORD COURT (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL



SILKY THREAD ROAD (PUBLIC)
(50' R.O.W.)
DESIGN SPEED – 25 MPH RESIDENTIAL

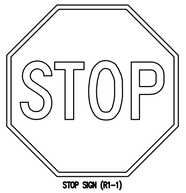


KEY MAP
SCALE: 1"=600'

KEY NOTE: A

ROAD NAME

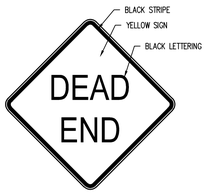
STREET NAME (D-3)



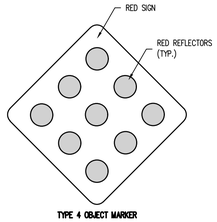
STOP SIGN (R1-1)



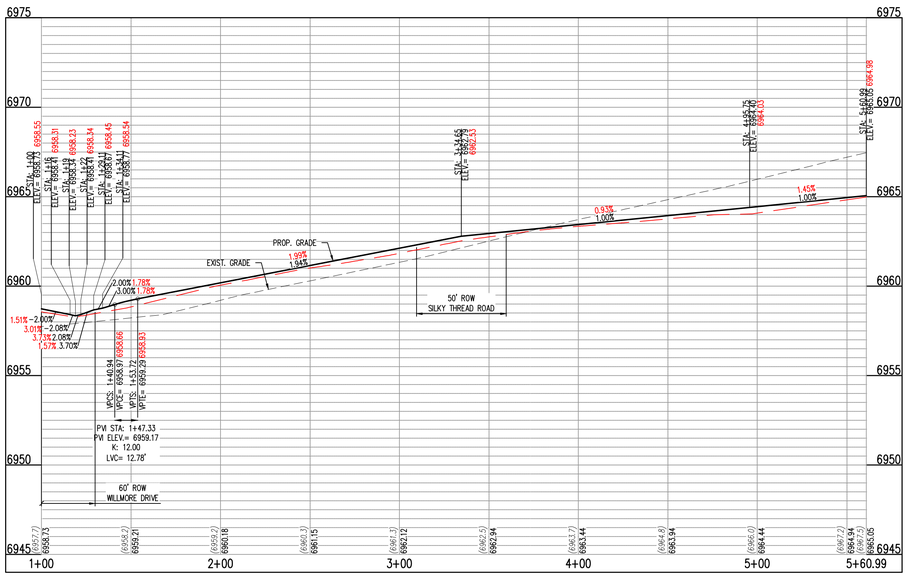
NO OUTLET SIGN (W14-2)
KEY NOTE: B



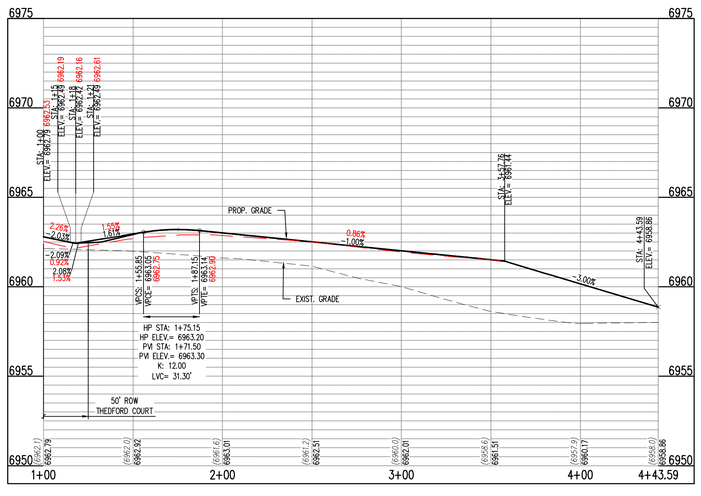
DEAD END SIGN (W14-1)
KEY NOTE: C



TYPE 4 OBJECT MARKER
KEY NOTE: D



THEDFORD CT – CL – 50' ROW
STA: 1+00 – 5+60.99
SCALE: H: 1"=40' V: 1"=10'



SIKY THRED RD EAST – CL – 50' ROW
STA: 1+00 – 4+43.59
SCALE: H: 1"=40' V: 1"=10'

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BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

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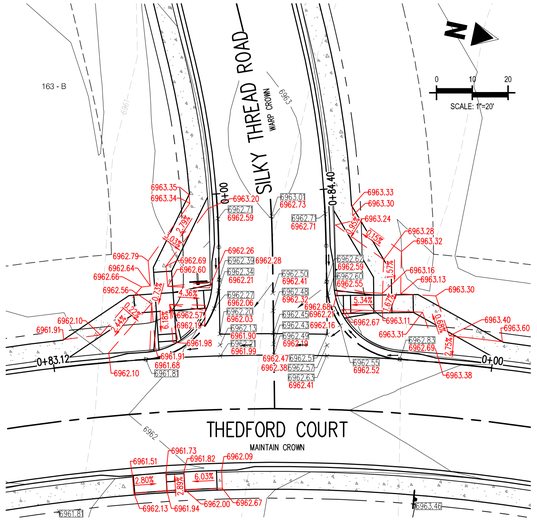
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

THEDFORD COURT & SILKY THREAD ROAD STREET IMPROVEMENT PLAN

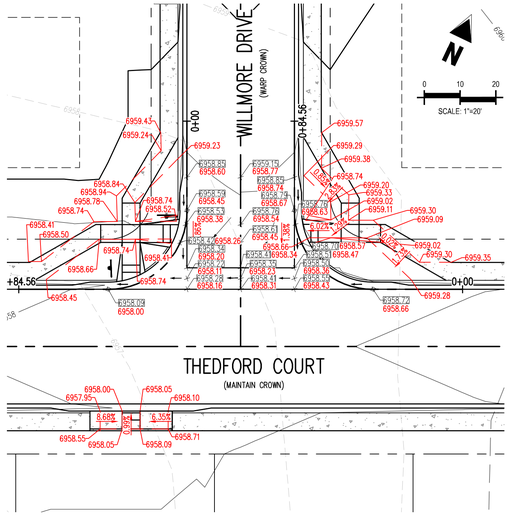
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Sheet 18 of 38

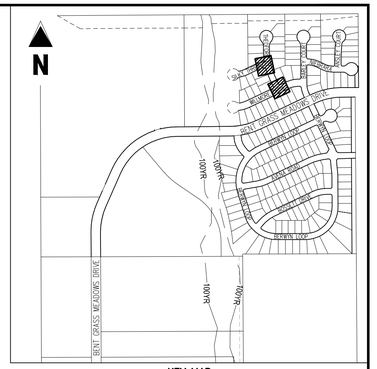
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INTERSECTION OF:
THEDFORD COURT & SILKY THREAD ROAD



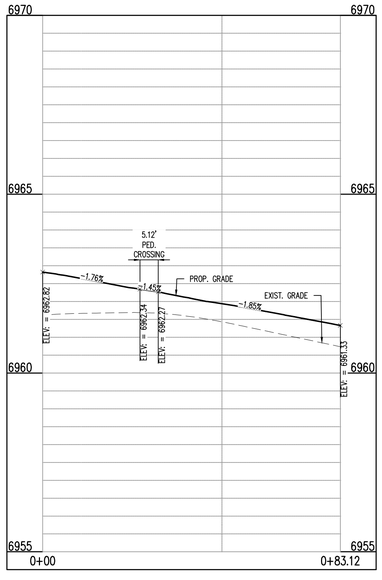
INTERSECTION OF:
WILLMORE DRIVE & THEDFORD COURT



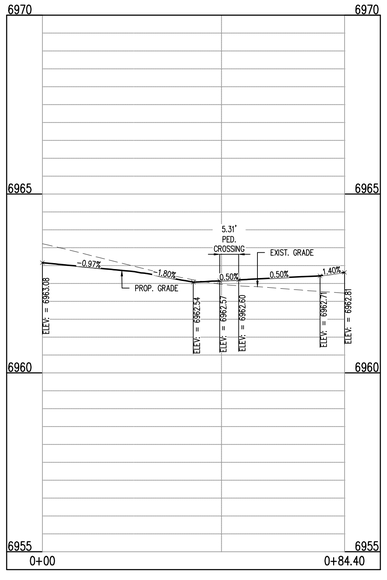
KEY MAP
SCALE: 1"=600'

LEGEND

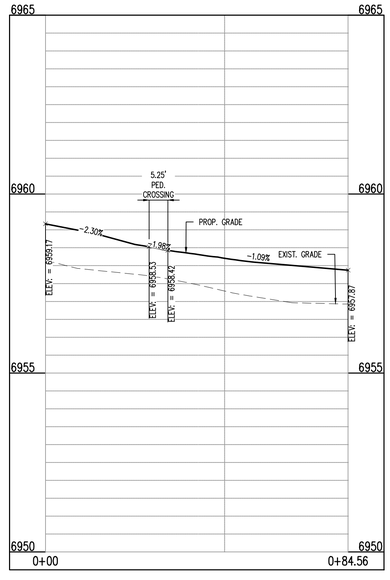
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION



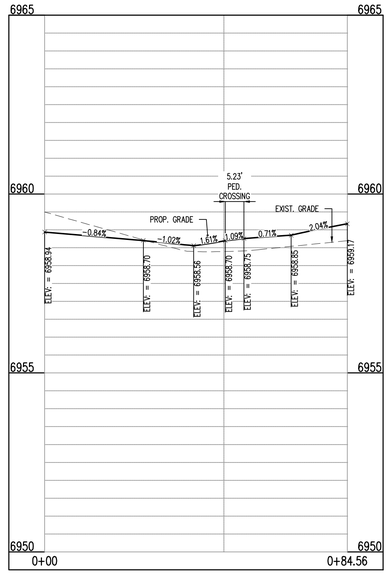
THEDFORD CT & SILK THREAD RD (SW): STA. 1+00.00 – 0+83.12
SCALE: H:1"=20', V:1"=10'



THEDFORD CT & SILK THREAD RD (NW): STA. 1+00.00 – 0+84.40
SCALE: H:1"=20', V:1"=10'



THEDFORD CT & WILLMORE DR (NW): STA. 1+00.00 – 0+84.56
SCALE: H:1"=20', V:1"=10'



THEDFORD CT & WILLMORE DR (NE): STA. 1+00.00 – 0+84.56
SCALE: H:1"=20', V:1"=10'

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE BEARING OF THE LINE BETWEEN THE SOUTHWEST CORNER OF SECTION 1, T13S, R65W AND THE WEST QUARTER CORNER SECTION 1, T13S, R65W IS N00°13'46"W AND MONUMENTED AS SHOWN:

BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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

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38164
03/16/2026
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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

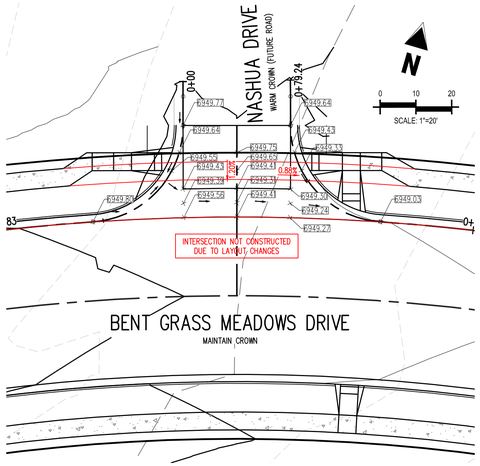
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

CROSS PAN & CURB
RETURN PROFILES

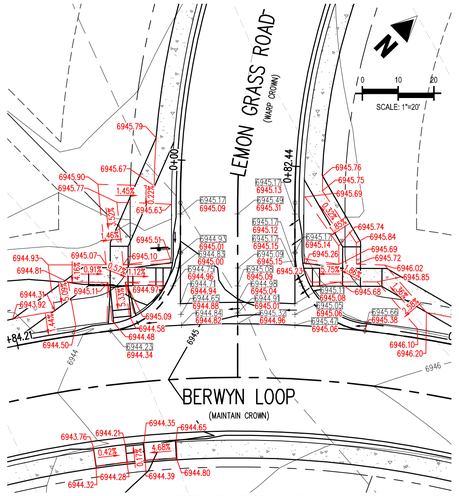
ASB2514

C3.01
Sheet 19 of 38

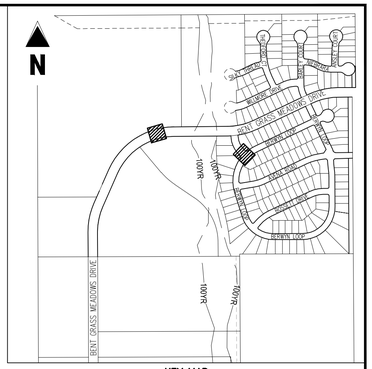
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INTERSECTION OF:
BENT GRASS MEADOWS DR & NASHUA DRIVE (FUTURE)



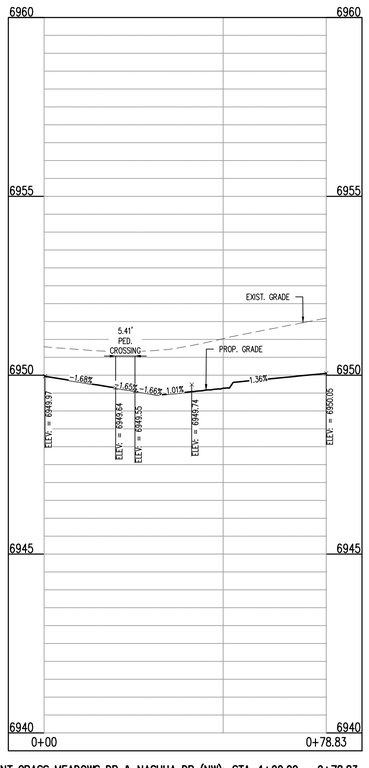
INTERSECTION OF:
BERWYN LOOP & LEMON GRASS ROAD



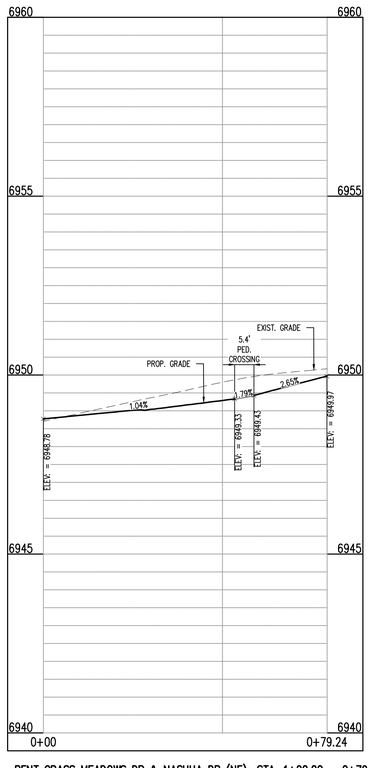
KEY MAP
SCALE: 1"=600'

LEGEND

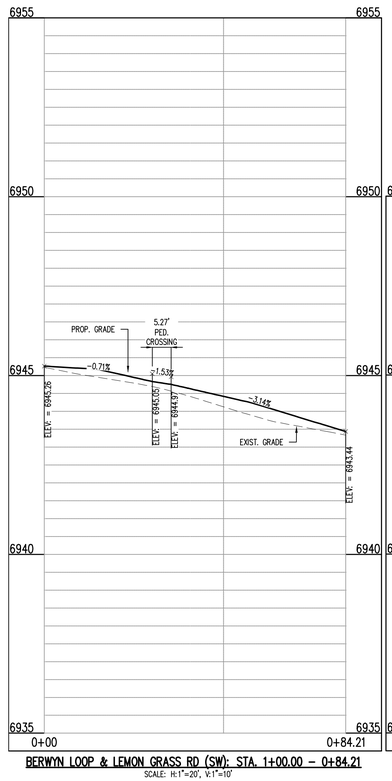
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- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION



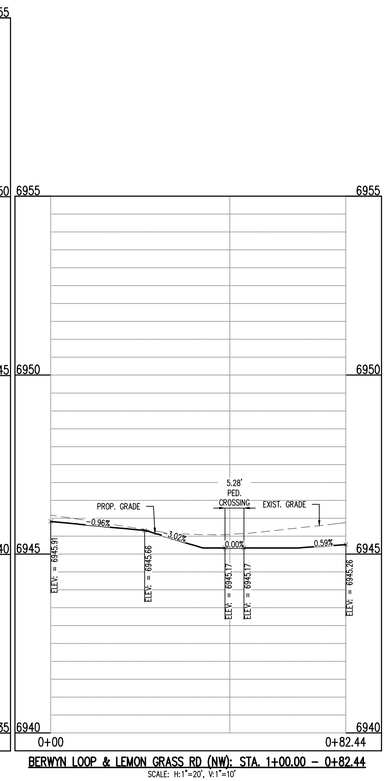
BENT GRASS MEADOWS DR & NASHUA DR (NW): STA. 1+00.00 – 0+78.83
SCALE: H:1"=20', V:1"=10'



BENT GRASS MEADOWS DR & NASHUA DR (NE): STA. 1+00.00 – 0+79.24
SCALE: H:1"=20', V:1"=10'



BERWYN LOOP & LEMON GRASS RD (SW): STA. 1+00.00 – 0+84.21
SCALE: H:1"=20', V:1"=10'



BERWYN LOOP & LEMON GRASS RD (NW): STA. 1+00.00 – 0+82.44
SCALE: H:1"=20', V:1"=10'

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

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BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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COLORADO REGISTERED 38164 PROFESSIONAL ENGINEER 03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

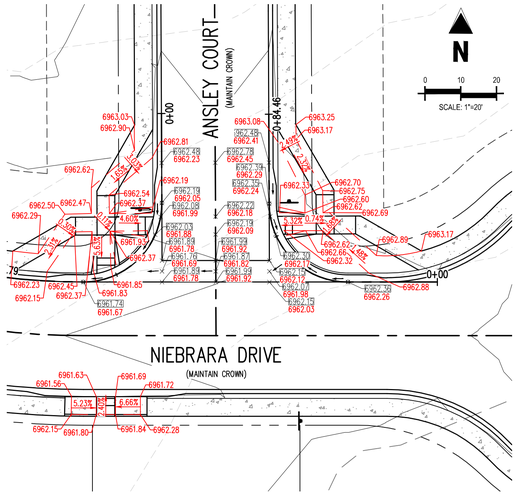
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

CROSS PAN & CURB
RETURN PROFILES

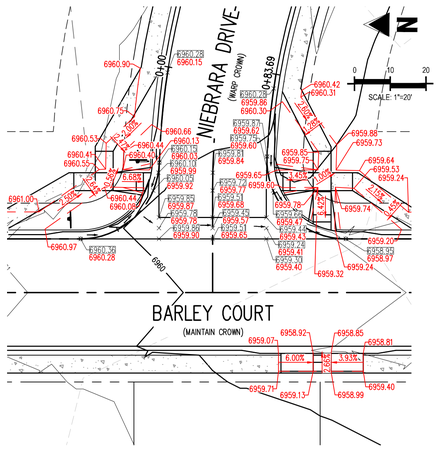
ASB2514

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Sheet 20 of 38

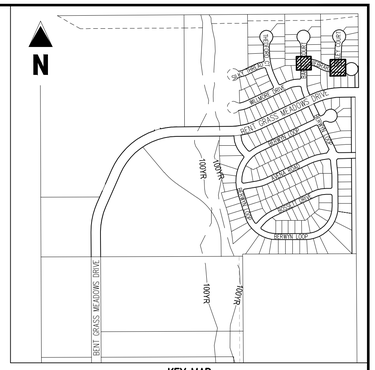
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INTERSECTION OF:
ANSLEY COURT & NIEBRARA DRIVE



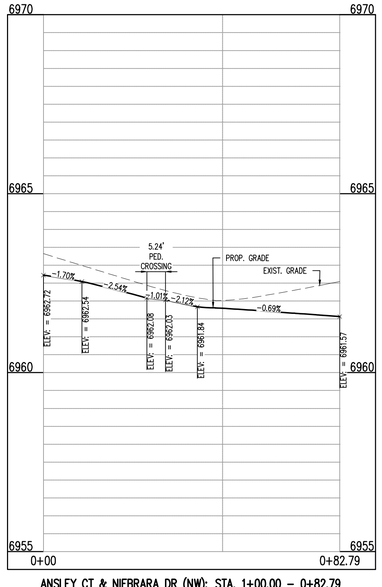
INTERSECTION OF:
BARLEY COURT & NIEBRARA DRIVE



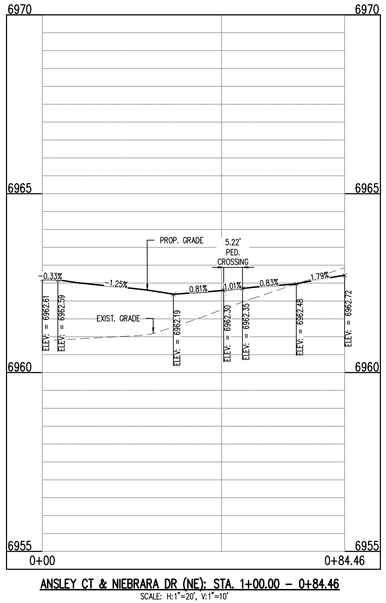
KEY MAP
SCALE: 1"=600'

LEGEND

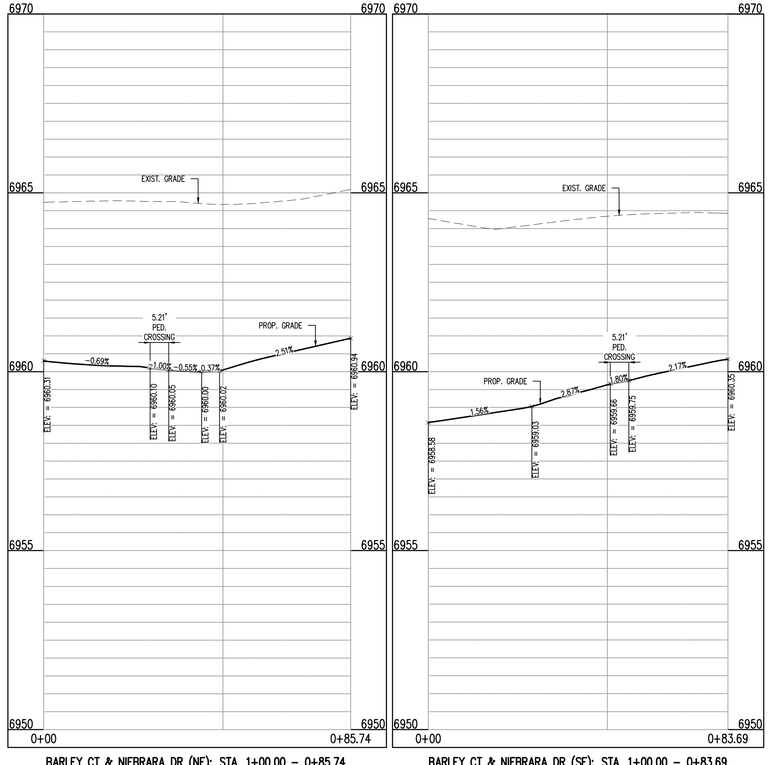
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- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION



ANSLEY CT & NIEBRARA DR (NW): STA. 1+00.00 – 0+82.79
SCALE: H:1"=20', V:1"=10'



ANSLEY CT & NIEBRARA DR (NE): STA. 1+00.00 – 0+84.46
SCALE: H:1"=20', V:1"=10'



BARLEY CT & NIEBRARA DR (NE): STA. 1+00.00 – 0+85.74
SCALE: H:1"=20', V:1"=10'

BARLEY CT & NIEBRARA DR (SE): STA. 1+00.00 – 0+83.69
SCALE: H:1"=20', V:1"=10'

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE BEARING OF THE LINE BETWEEN THE SOUTHWEST CORNER OF SECTION 1, T13S, R65W AND THE WEST QUARTER CORNER SECTION 1, T13S, R65W IS N00°13'46"W AND MONUMENTED AS SHOWN:

BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

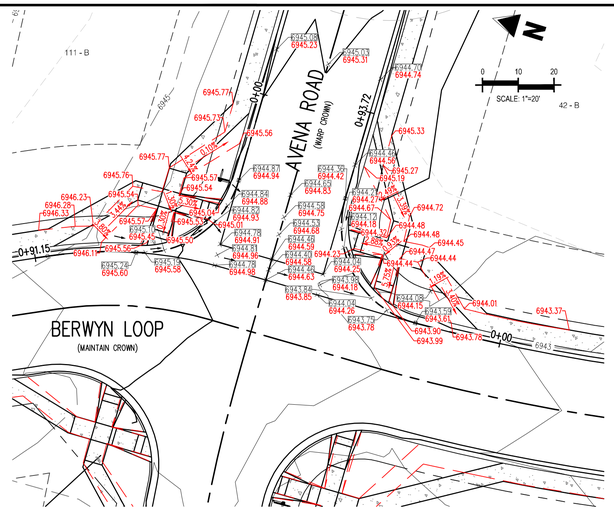
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

CROSS PAN & CURB
RETURN PROFILES

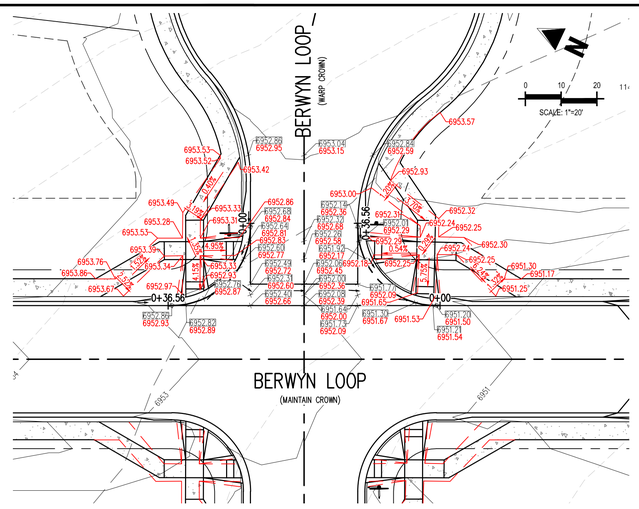
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Sheet 21 of 38

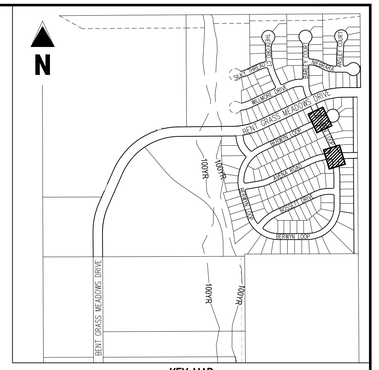
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INTERSECTION OF:
AVENA ROAD & BERWYN LOOP



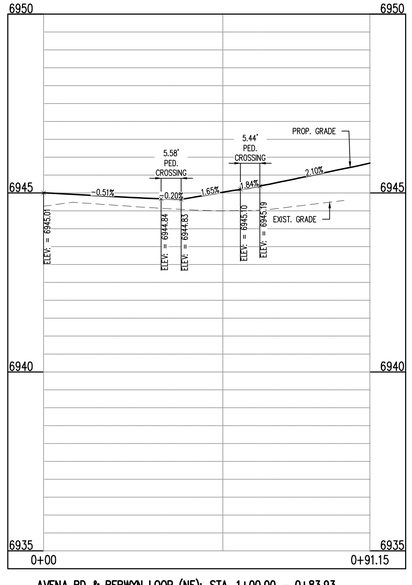
INTERSECTION OF:
BERWYN LOOP & BERWYN LOOP



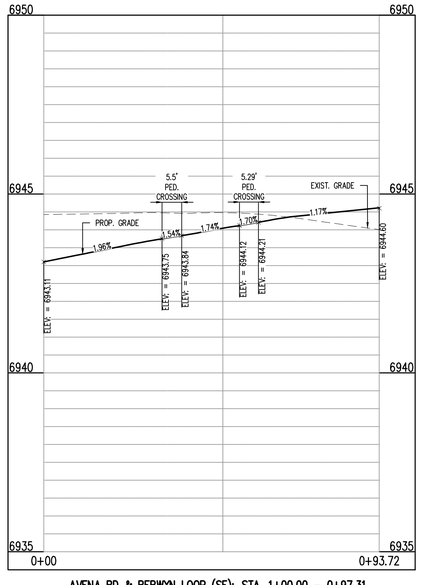
KEY MAP
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LEGEND

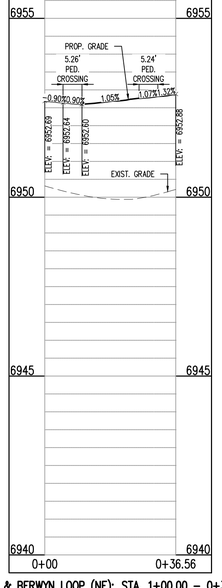
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- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION



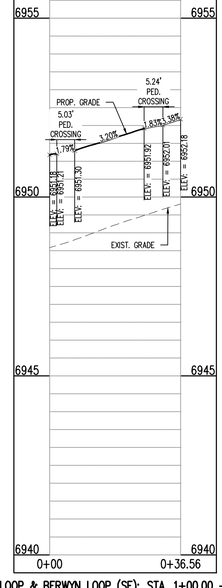
AVENA RD & BERWYN LOOP (NE): STA. 1+00.00 – 0+83.93
SCALE: H:1"=20', V:1"=10'



AVENA RD & BERWYN LOOP (SE): STA. 1+00.00 – 0+97.31
SCALE: H:1"=20', V:1"=10'



BERWYN LOOP & BERWYN LOOP (NE): STA. 1+00.00 – 0+36.56
SCALE: H:1"=20', V:1"=10'



BERWYN LOOP & BERWYN LOOP (SE): STA. 1+00.00 – 0+36.56
SCALE: H:1"=20', V:1"=10'

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

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BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

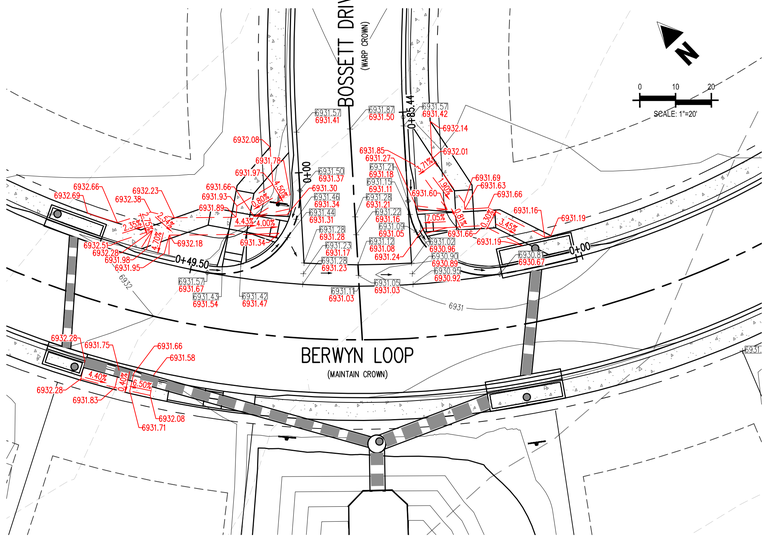
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

CROSS PAN & CURB RETURN PROFILES

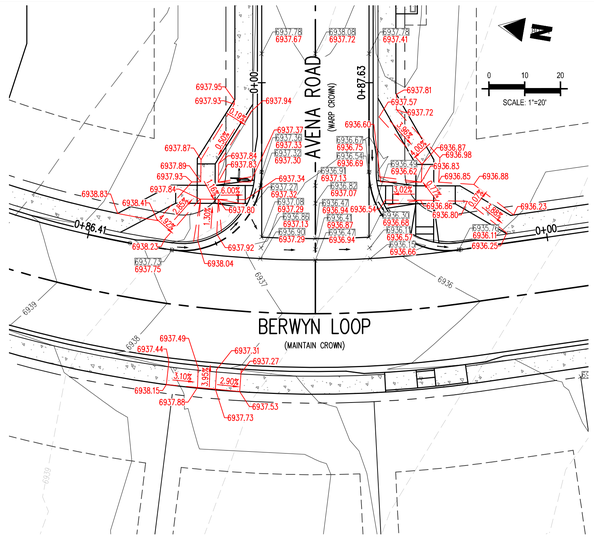
ASB2514

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Sheet 22 of 38

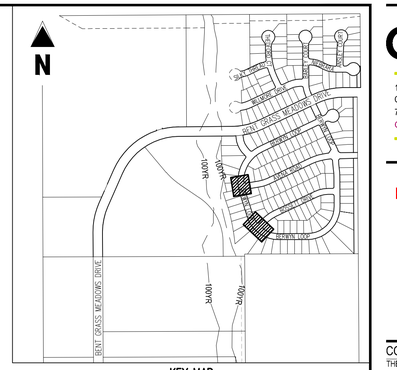
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INTERSECTION OF:
BERWYN LOOP & BOSSETT DRIVE



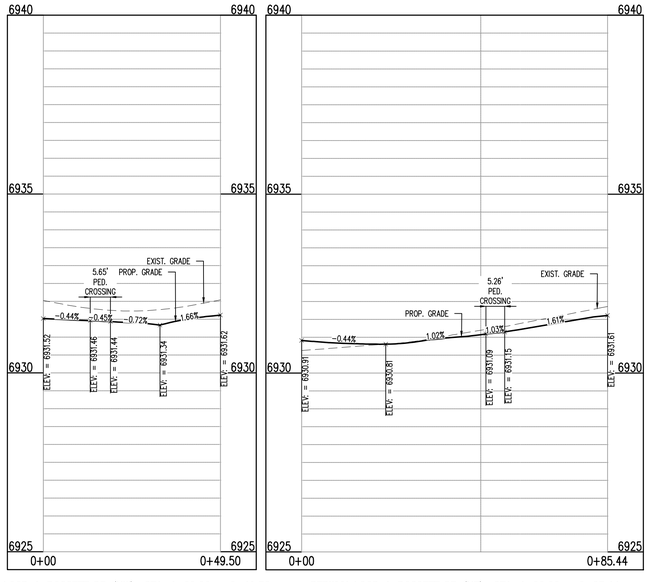
INTERSECTION OF:
BERWYN LOOP & AVENA ROAD



KEY MAP
SCALE: 1"=600'

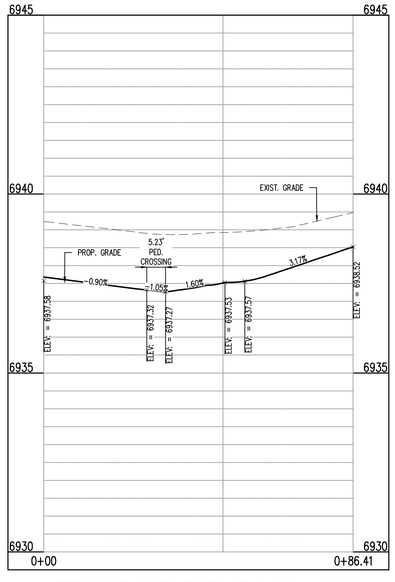
LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION

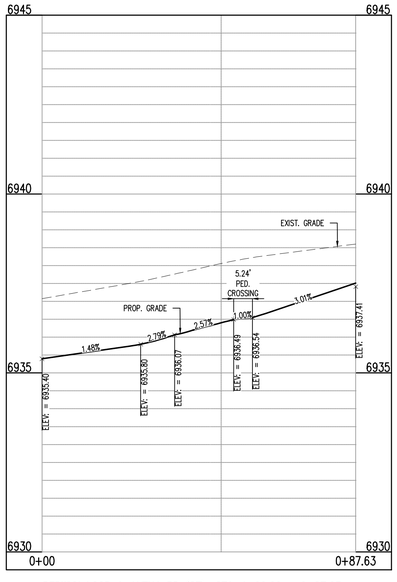


BERWYN LOOP & BOSSETT DR (NW): STA. 1+00.00 – 0+49.50
SCALE: H:1"=20', V:1"=10'

BERWYN LOOP & BOSSETT DR (NE): STA. 1+00.00 – 0+85.44
SCALE: H:1"=20', V:1"=10'



BERWYN LOOP & AVENA RD (NE): STA. 1+00.00 – 0+86.41
SCALE: H:1"=20', V:1"=10'



BERWYN LOOP & AVENA RD (SE): STA. 1+00.00 – 0+87.63
SCALE: H:1"=20', V:1"=10'

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

ALL BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE BEARING OF THE LINE BETWEEN THE SOUTHWEST CORNER OF SECTION 1, T13S, R65W AND THE WEST QUARTER CORNER SECTION 1, T13S, R65W IS N00°13'46"W AND MONUMENTED AS SHOWN:

BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

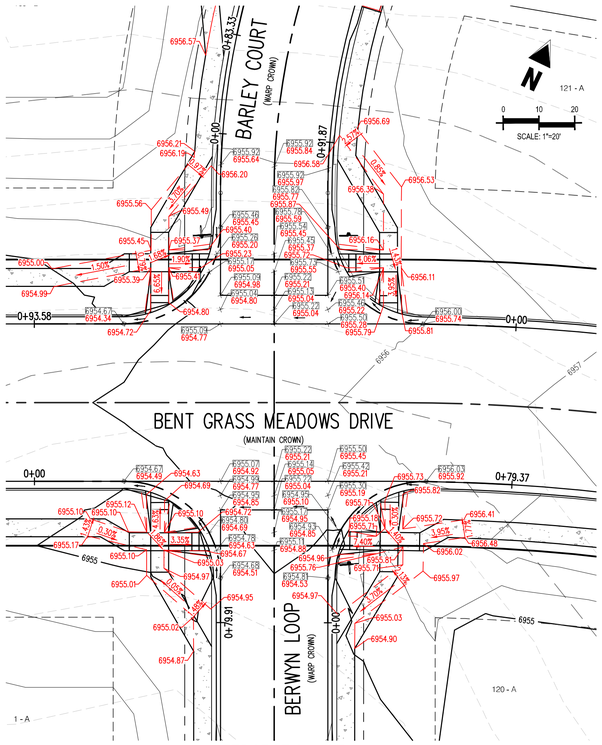
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

CROSS PAN & CURB
RETURN PROFILES

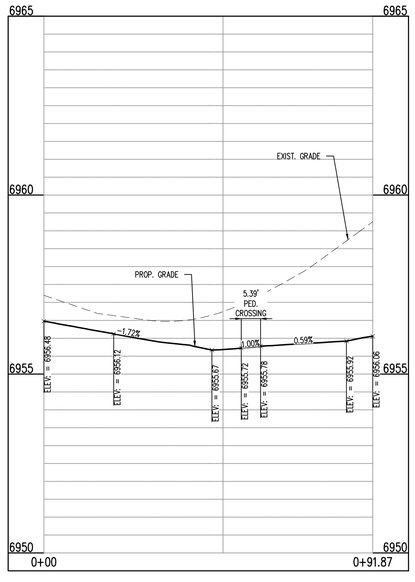
ASB2514

C3.05
Sheet 23 of 38

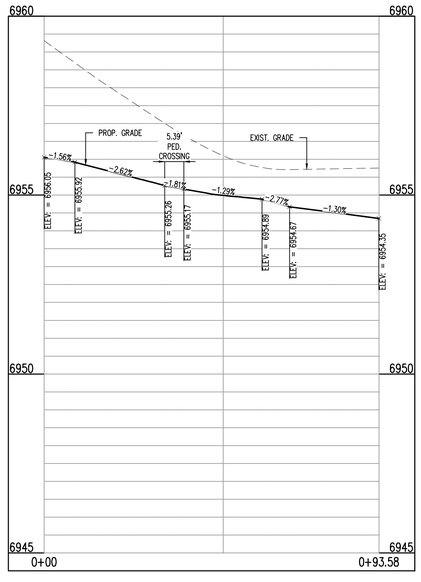
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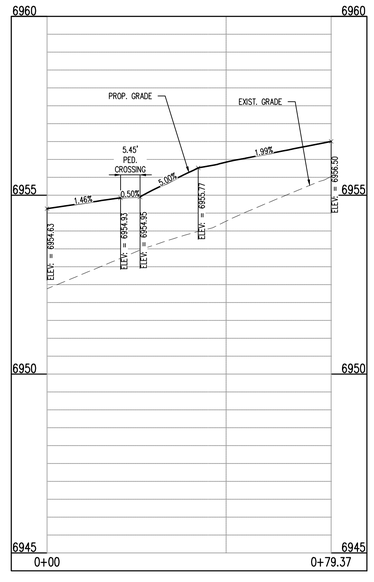
INTERSECTION OF:
BENT GRASS MEADOWS DRIVE, BARLEY COURT & BERWYN LOOP



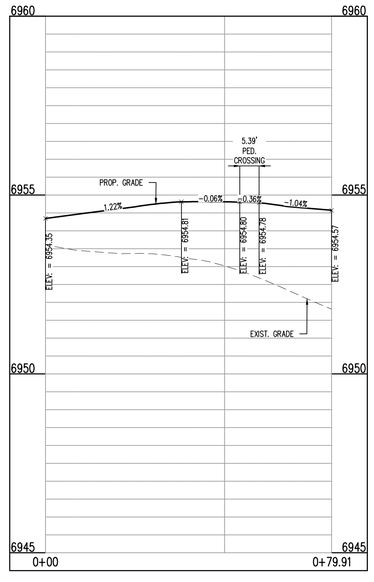
BENT GRASS MEADOWS DR & BARLEY CT (NE): STA. 1+00.00 – 0+91.87
SCALE: H:1"=20', V:1"=10'



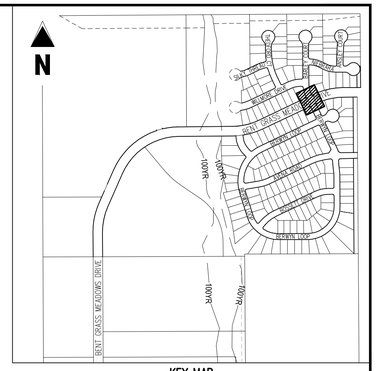
BENT GRASS MEADOWS DR & BARLEY CT (NW): STA. 1+00.00 – 0+93.58
SCALE: H:1"=20', V:1"=10'



BENT GRASS MEADOWS DR & BERWYN LOOP (SE): STA. 1+00.00 – 0+79.37
SCALE: H:1"=20', V:1"=10'



BENT GRASS MEADOWS DR & BERWYN LOOP (SW): STA. 1+00.00 – 0+79.91
SCALE: H:1"=20', V:1"=10'



KEY MAP
SCALE: 1"=600'

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION

LEGAL DESCRIPTION

BENT GRASS RESIDENTIAL FILING NO. 2, LOCATED IN THE NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO

BASIS OF BEARINGS

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BENCHMARK

THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4. MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

CAUTION – NOTICE TO CONTRACTOR

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

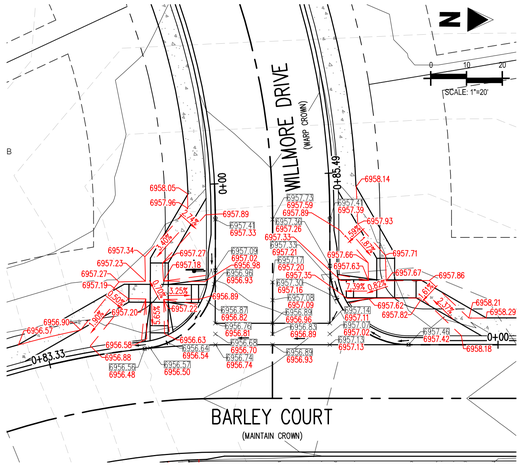
CROSS PAN & CURB RETURN PROFILES

ASB2514

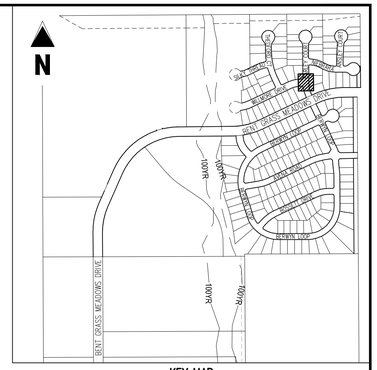
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Sheet 24 of 38

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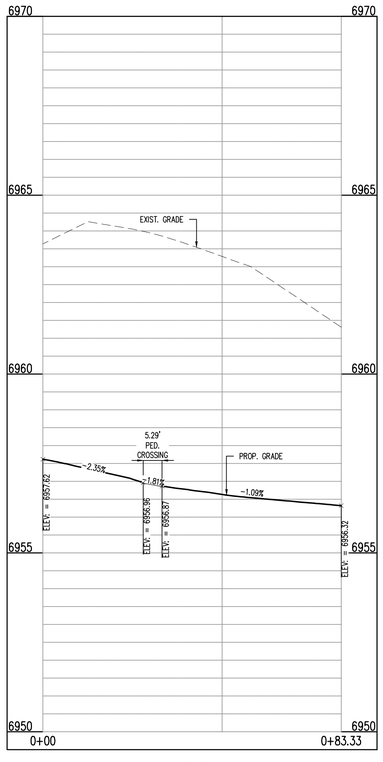
INTERSECTION OF:
WILLMORE DRIVE & BARLEY COURT



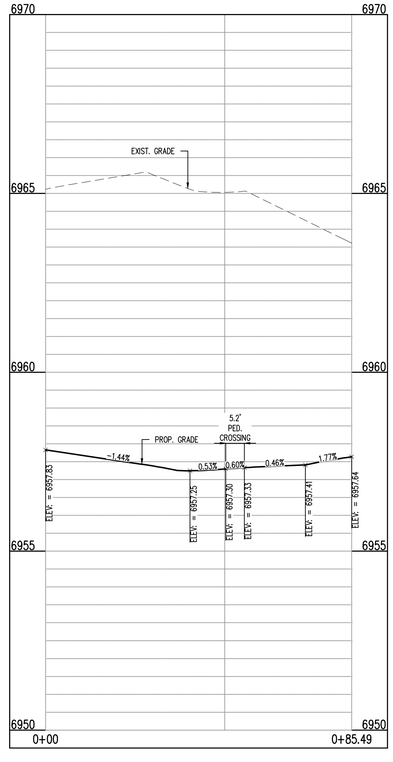
KEY MAP
SCALE: 1"=600'

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED LOT LINE
- PROPOSED MOUNTABLE CURB
- PROPOSED VERTICAL CURB
- PROPOSED SIDEWALK
- PROPOSED GUTTER FLOW DIRECTION
- ASPHALT ROADWAY SURFACE RUNOFF DIRECTION
- PROPOSED SPOT ELEVATION



BARLEY CT & WILLMORE DR (SW): STA. 1+00.00 – 0+83.33
SCALE: H:1"=20', V:1"=10'



BARLEY CT & WILLMORE DR (NW): STA. 1+00.00 – 0+85.49
SCALE: H:1"=20', V:1"=10'

LEGAL DESCRIPTION

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THE SOUTHWESTERLY CORNER OF LOT 1 WOODMEN HILLS FILING NO. 4, MONUMENTED BY A YELLOW PLASTIC SURVEYORS CAP ON A NO. 4 REBAR LS# 24954 ELEVATION = 6947.67

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

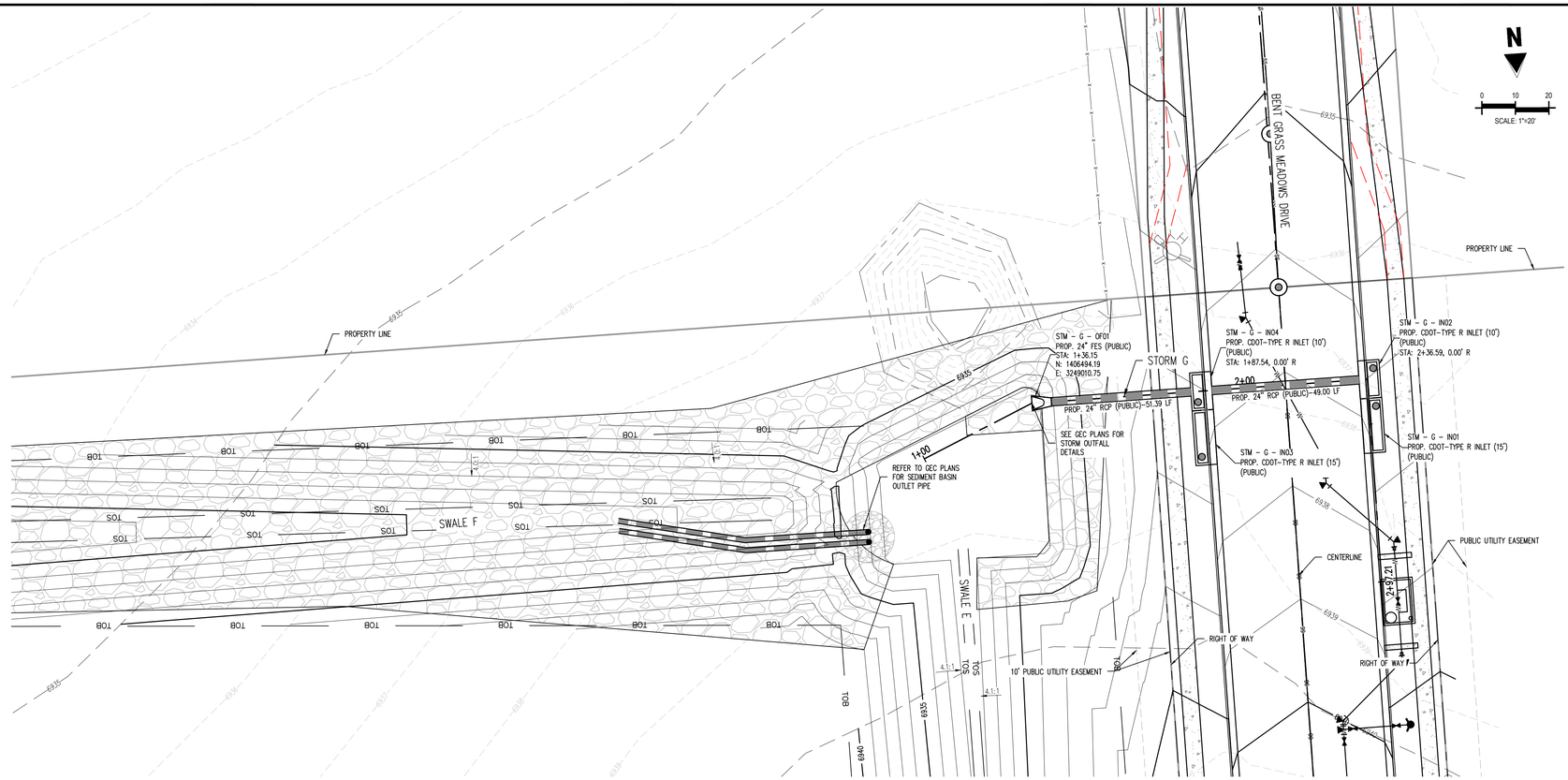
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Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

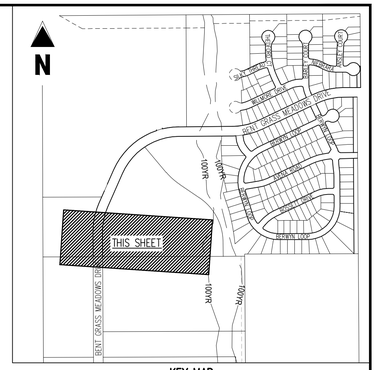
CROSS PAN & CURB
RETURN PROFILES

ASB2514

C3.07
Sheet 25 of 38

W:\CC\Challenger Homes (HCC)\ El Paso County\CLH00014.20\Civil\ Cornet\CAD\3.0 CDNR Plan Cornet\[CLH14.20_CrossPan.dwg, Kendra Cridlin, 3/13/2026





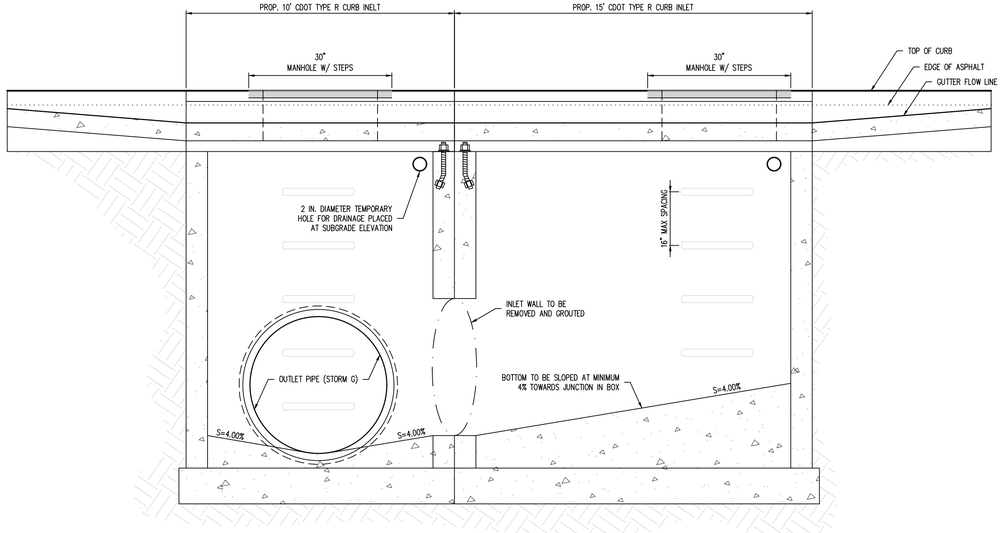
KEY MAP
SCALE: 1"=600'

LEGEND

- EXISTING MINOR CONTOUR (6931)
- EXISTING MAJOR CONTOUR (6930)
- PROPOSED MINOR CONTOUR (6941)
- PROPOSED MAJOR CONTOUR (6940)
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 100 - YR FLOODPLAIN LINE (100YR)
- TOE OF SLOPE (TOS)
- TOP OF BANK (TOB)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- GROUTED BOULDERS
- GRAVEL (CDOT CLASS 6)
- RIPRAP
- ASPHALT PAVING

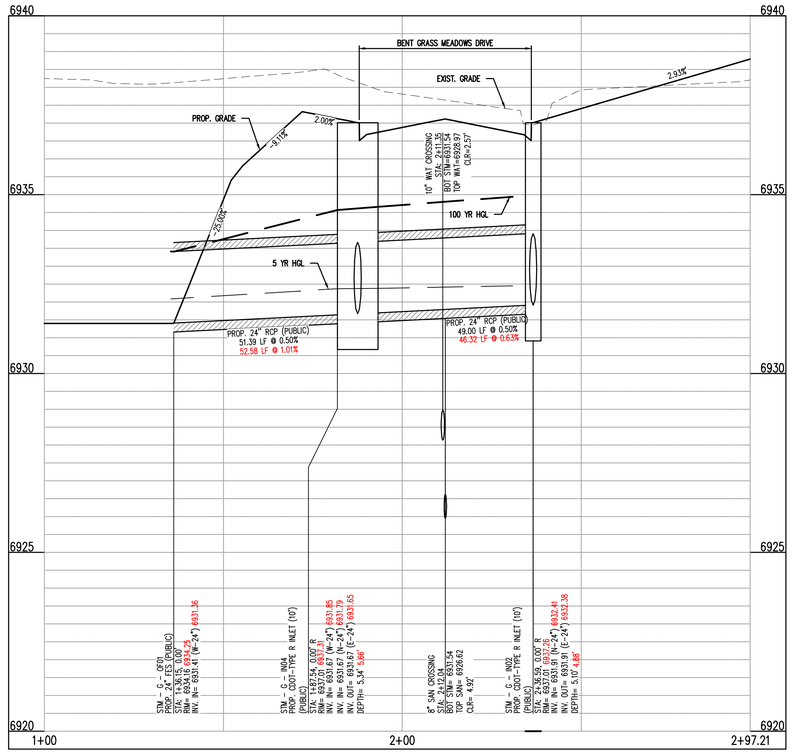
NOTE

UNLESS OTHERWISE NOTED, ALL RIPRAP SHOWN IS TO BE TYPE L-18" DEPTH.



NOTE:
1. DETAIL FOR PURPOSES OF INLET ATTACHMENT ONLY. REFER TO CDOT STANDARD PLAN NO. M-604-12 FOR CONSTRUCTION DETAILS.

ATTACHMENT DETAIL – CDOT TYPE R CURB INLETS
NOT TO SCALE



ALIGN – STM – G
STA: 1+00 – 2+97.21
SCALE: H: 1"=20' V: 1"=10'

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

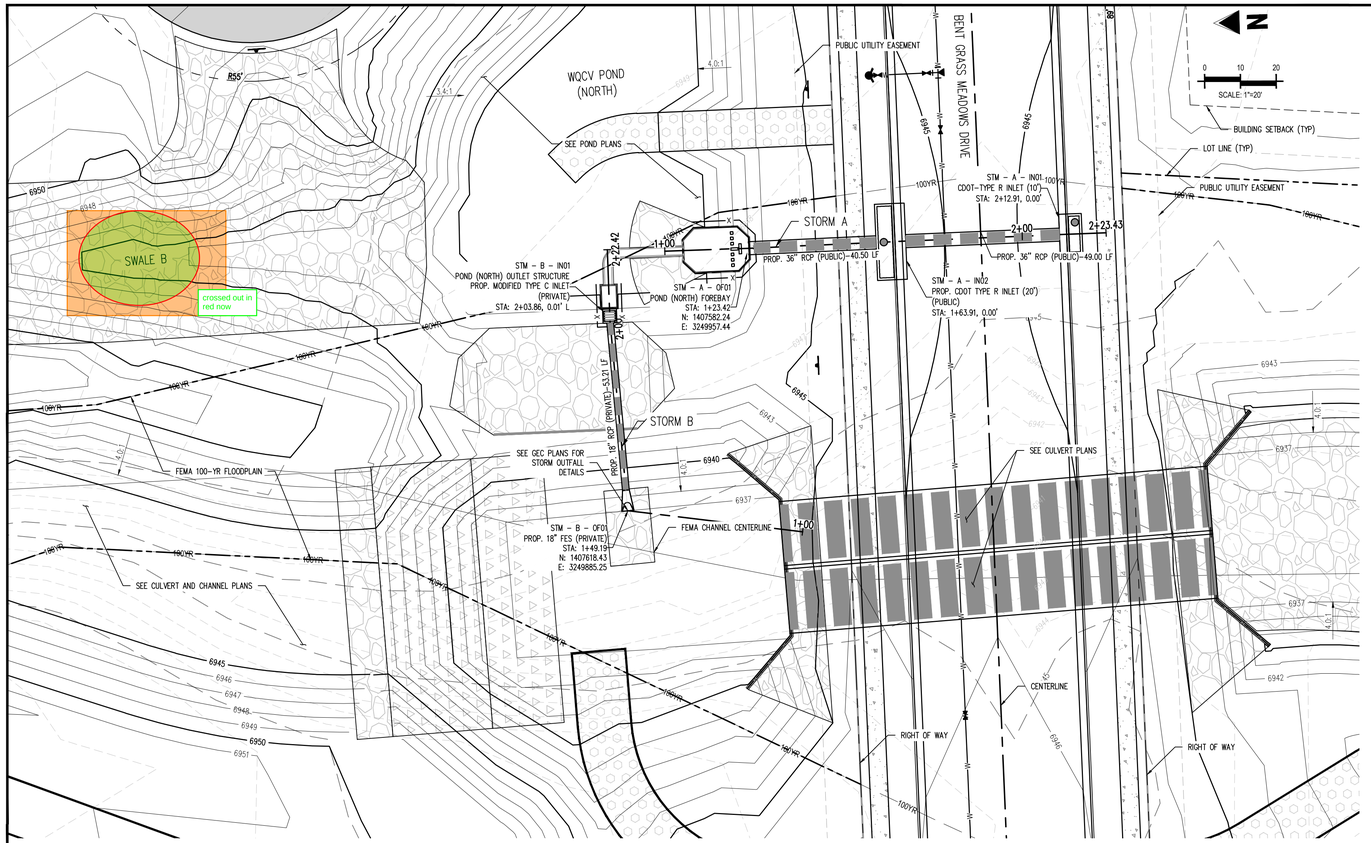
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Date:	3/13/26

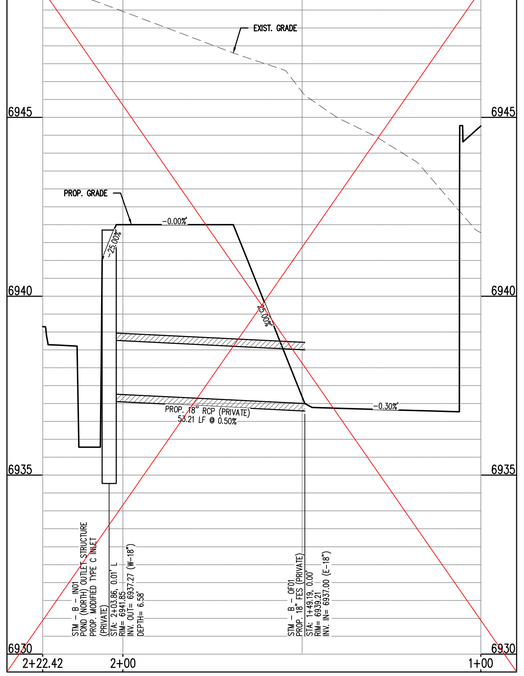
BENT GRASS MEADOWS DRIVE STORM PLAN & PROFILE

ASB2514

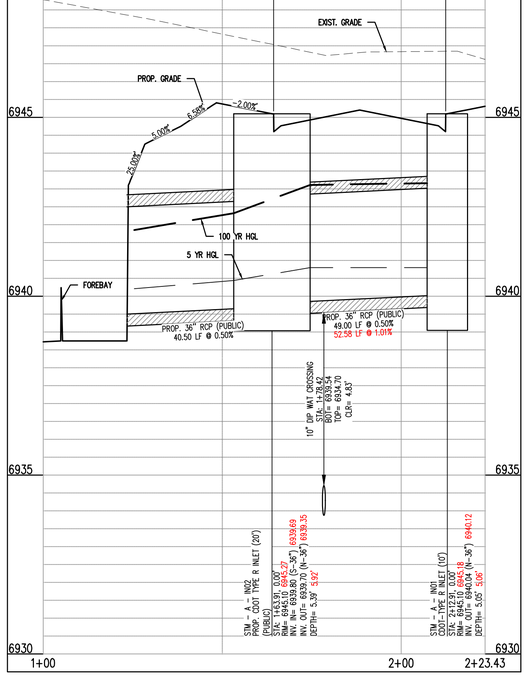
C4.01
Sheet 26 of 38

M:\Challenger Homes Inc\COL El Paso County\CLH000014 Driftwood Estates\CAD\C4.01 Bent Grass STM_PNP.dwg - Sara Nikolic - 3/13/2026





ALIGN – STM – B
STA: 1+00 = 2+22.42 (SCALE: H: 1"=20, V: 1" = 10')



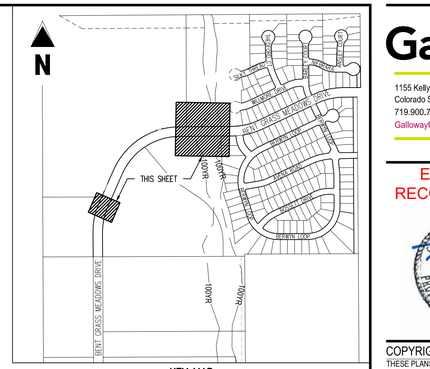
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STA: 1+00 = 2+23.43 (SCALE: H: 1"=20, V: 1" = 10')

LEGEND

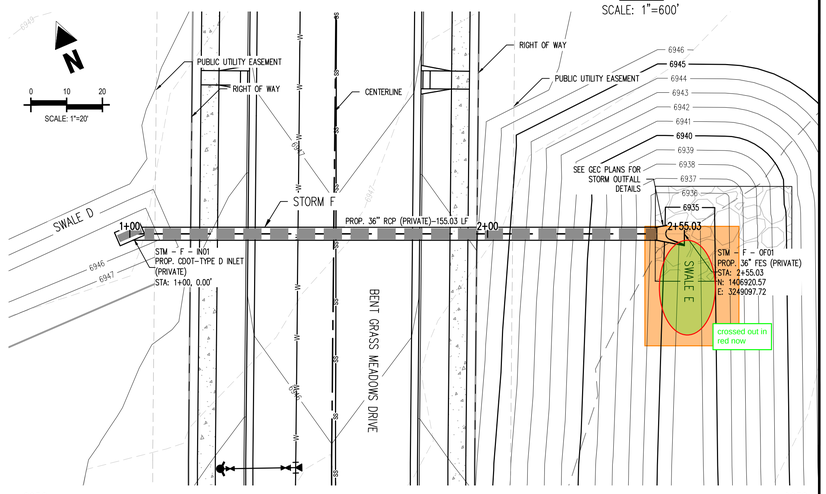
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 100 – YR FLOODPLAIN LINE
- TOE OF SLOPE
- TOP OF BANK
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- GROUTED BOULDERS
- GRAVEL (CDOT CLASS 6)
- RIPRAP
- ASPHALT PAVING

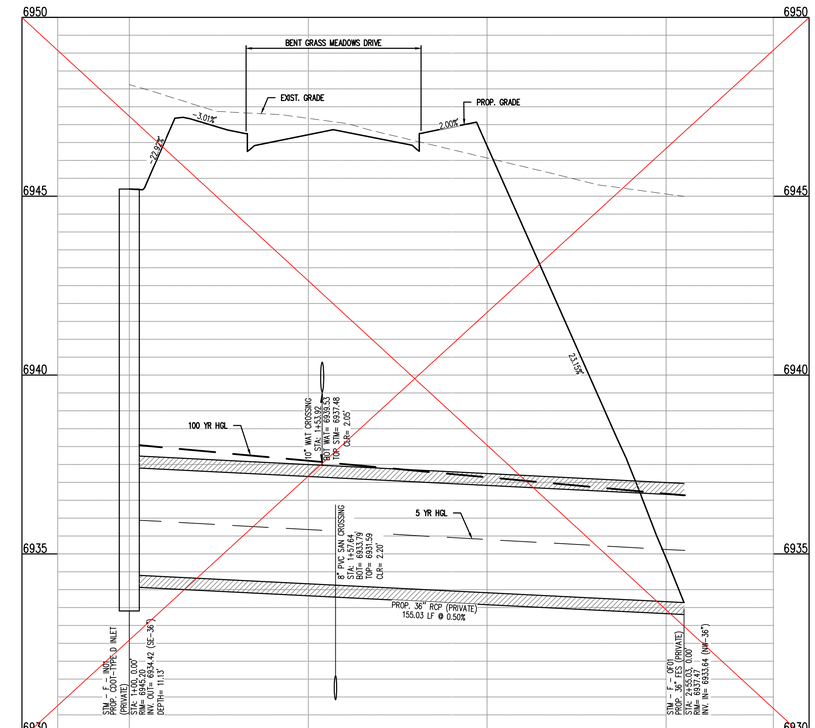
NOTE

UNLESS OTHERWISE NOTED, ALL RIPRAP SHOWN IS TO BE TYPE L–18" DEPTH.



KEY MAP
SCALE: 1"=600'





ALIGN – STM – F
STA: 0+80 = 2+80.00 (SCALE: H: 1"=20, V: 1" = 10')

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COLORADO REGISTERED 38164 PROFESSIONAL ENGINEER 03/16/2026

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CHALLENGER HOMES

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FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

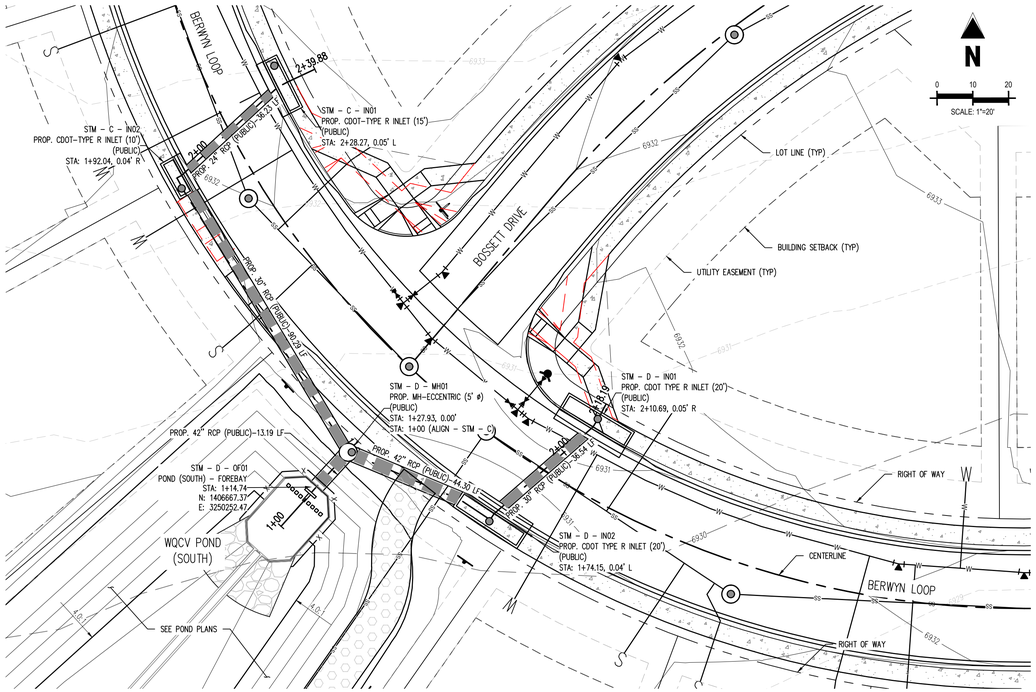
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

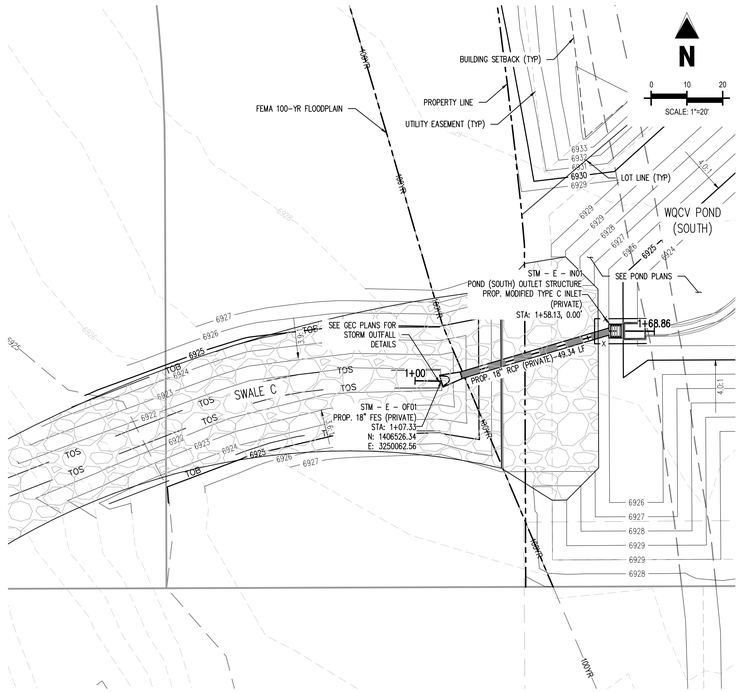
BENT GRASS MEADOWS DRIVE STORM PLAN & PROFILE

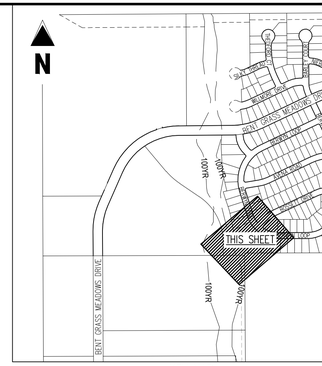
ASB2514

C4.02
Sheet 27 of 38

W:\Challenger Homes Inc\CO\...\El Paso County\CLH000014.20\Bent Grass\CAD\C4.02\C4.02 Bent Grass STM_P&P Plan - Data Sheet.dwg - 3/13/2026





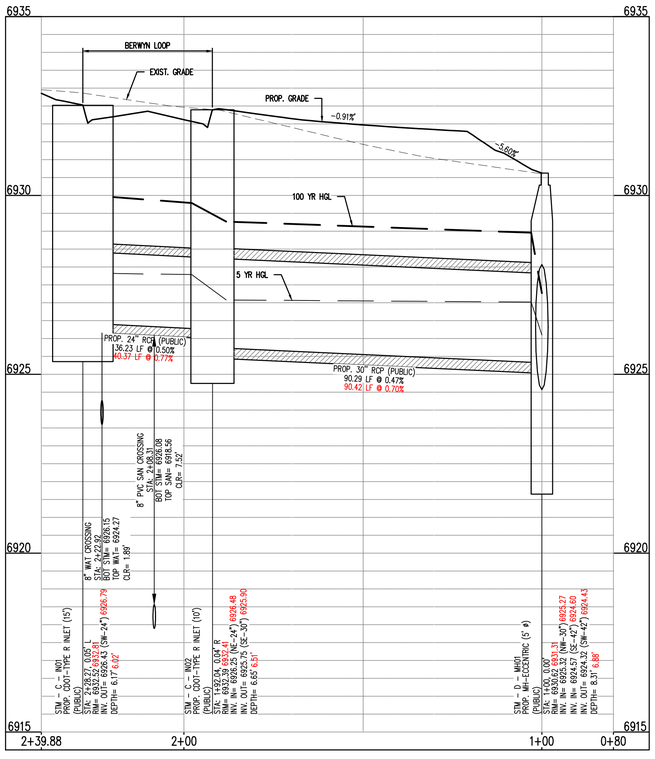


KEY MAP
SCALE: 1"=600'

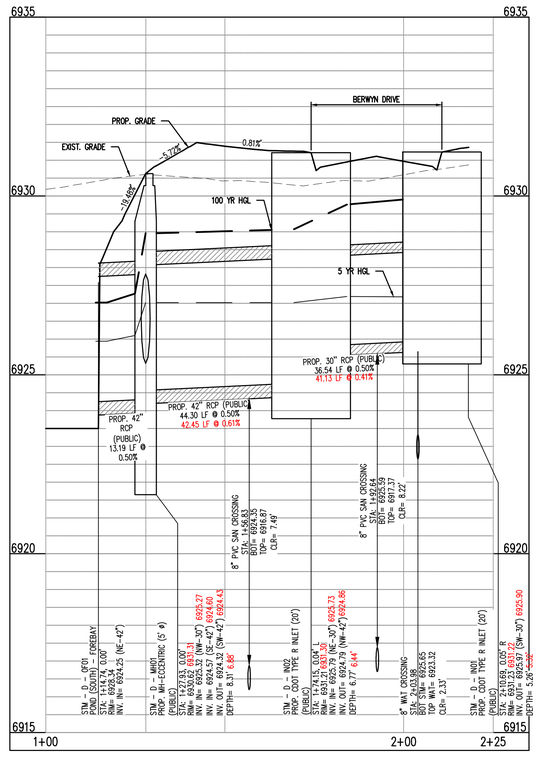
LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 100 – YR FLOODPLAIN LINE
- TOE OF SLOPE
- TOP OF BANK
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- GROUTED BOULDERS
- GRAVEL (CDOT CLASS 6)
- RIPRAP
- ASPHALT PAVING

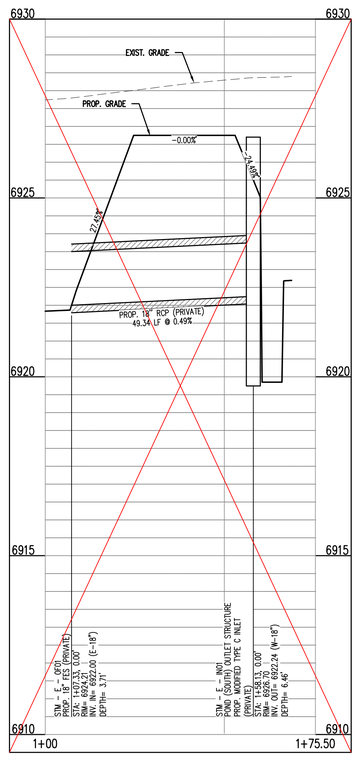
NOTE
UNLESS OTHERWISE NOTED, ALL RIPRAP SHOWN IS TO BE TYPE L–18" DEPTH.



ALIGN – STM – C
STA: 0+80 – 2+39.88 (SCALE: H: 1"=20, V: 1" = 10')



ALIGN – STM – D
STA: 1+00 – 2+18.19 (SCALE: H: 1"=20, V: 1" = 10')



ALIGN – STM – E
STA: 1+00 – 1+75.50 (SCALE: H: 1"=20, V: 1" = 10')

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ENGINEERING
RECORD DRAWINGS

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38164
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PROFESSIONAL ENGINEER

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BERWYN LOOP STORM
PLAN & PROFILE

ASB2514

C4.03
Sheet 28 of 38

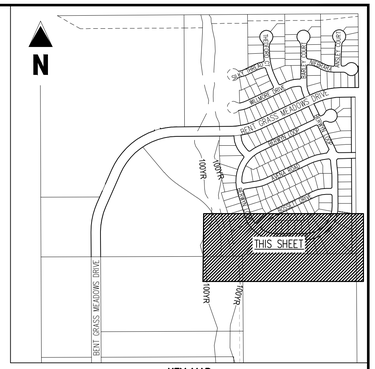
W:\Challenger Homes (HCD)\ El Paso County (CLH000014.20)\Bent Grass\CAD\C1 ECM\ Plans (Overall)\Civil\4.20_Profile Berwyn Overall ECM.dwg, Erica Nesbitt, 3/13/2026

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 100 - YR FLOODPLAIN LINE
- TOE OF SLOPE
- TOP OF BANK
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- GROUTED BOULDERS
- GRAVEL (CDOT CLASS 6)
- RIPRAP
- ASPHALT PAVING

NOTE

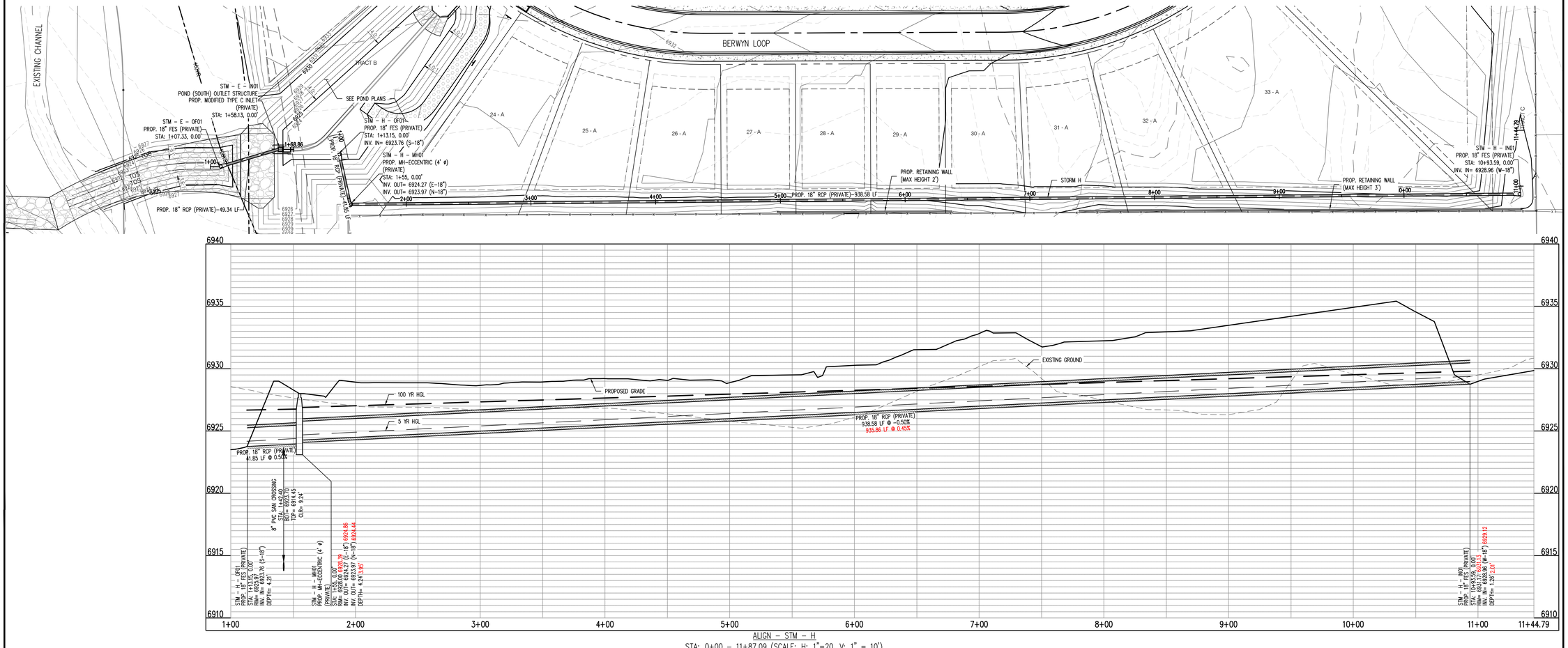
UNLESS OTHERWISE NOTED, ALL RIPRAP SHOWN IS TO BE TYPE L-18" DEPTH.



KEY MAP
SCALE: 1"=600'

N

0 20 40
SCALE: 1"=40'



ALIGN - STM - H
STA: 0+00 - 11+87.09 (SCALE: H: 1"=20, V: 1" = 10')

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CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

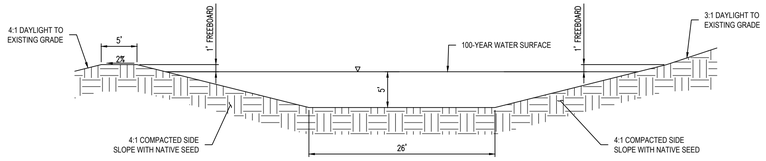
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

STORM H - PLAN & PROFILE

ASB2514

C4.04
Sheet 29 of 38

M:\Challenger Homes Inc\CO, El Paso County\CLH000014.20\Bent Grass\CAD\C4.04 Plan Overlot.dwg, Jared Hay - Ryan Martin - 3/13/2026



NORTH CHANNEL TYPICAL SECTION
SCALE: 1"=10'

LEGEND

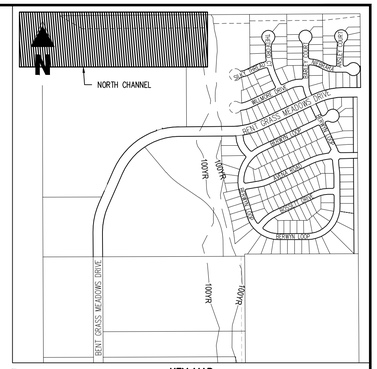
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 100 – YR FLOODPLAIN LINE
- TOE OF SLOPE
- TOP OF BANK
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- GROUTED BOULDERS
- GRAVEL (CDOT CLASS 6)
- RIPRAP
- ASPHALT PAVING

N

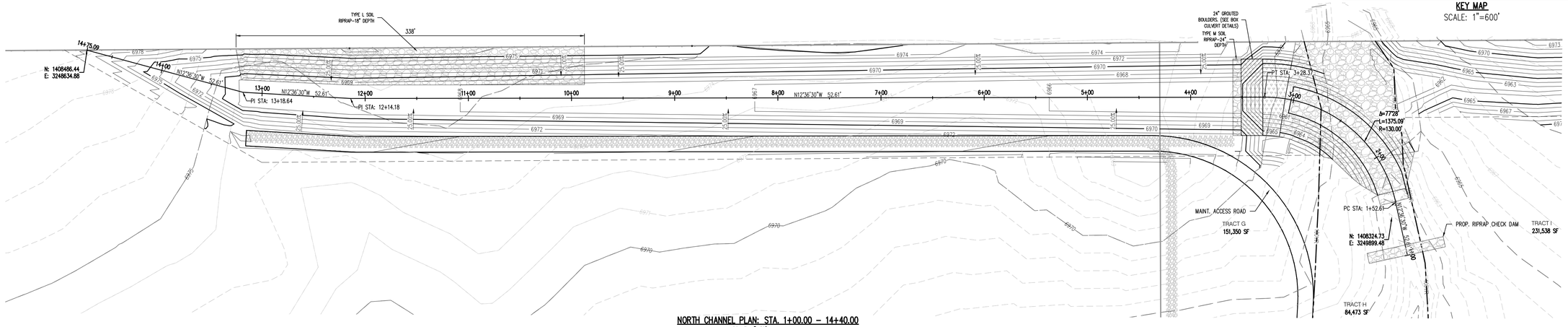
0 10 20 50
SCALE: 1"=50'

NOTE

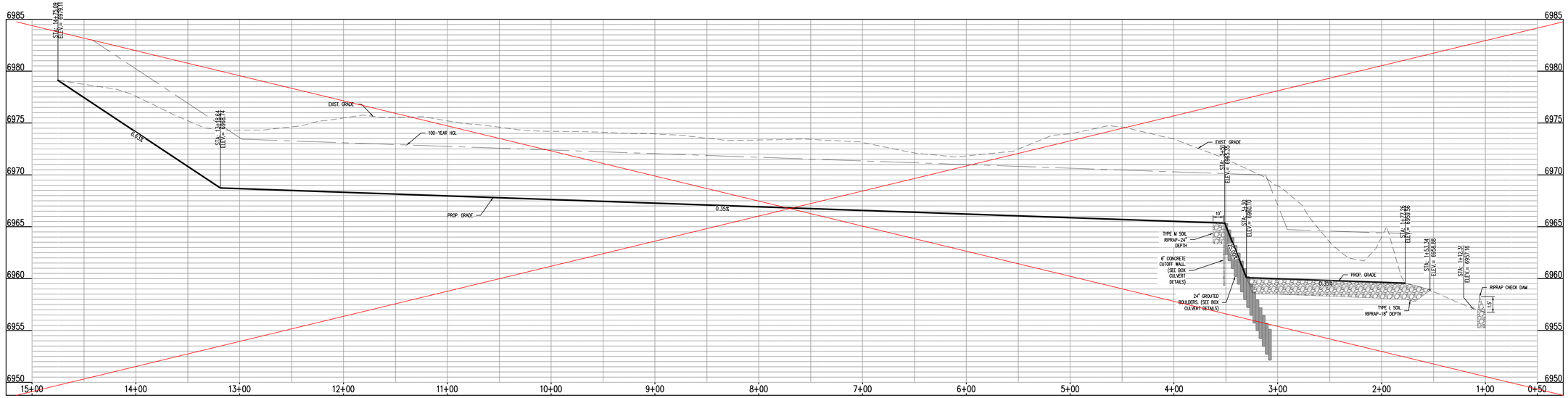
UNLESS OTHERWISE NOTED, ALL RIPRAP SHOWN IS TO BE TYPE L–18" DEPTH.



KEY MAP
SCALE: 1"=600'



NORTH CHANNEL PLAN: STA. 1+00.00 – 14+40.00
SCALE: 1"=50'



NORTH CHANNEL PROFILE: STA. 0+80.00 – 14+40.00
SCALE: H:1"=50', V:1"=5'

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03/16/2026

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BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

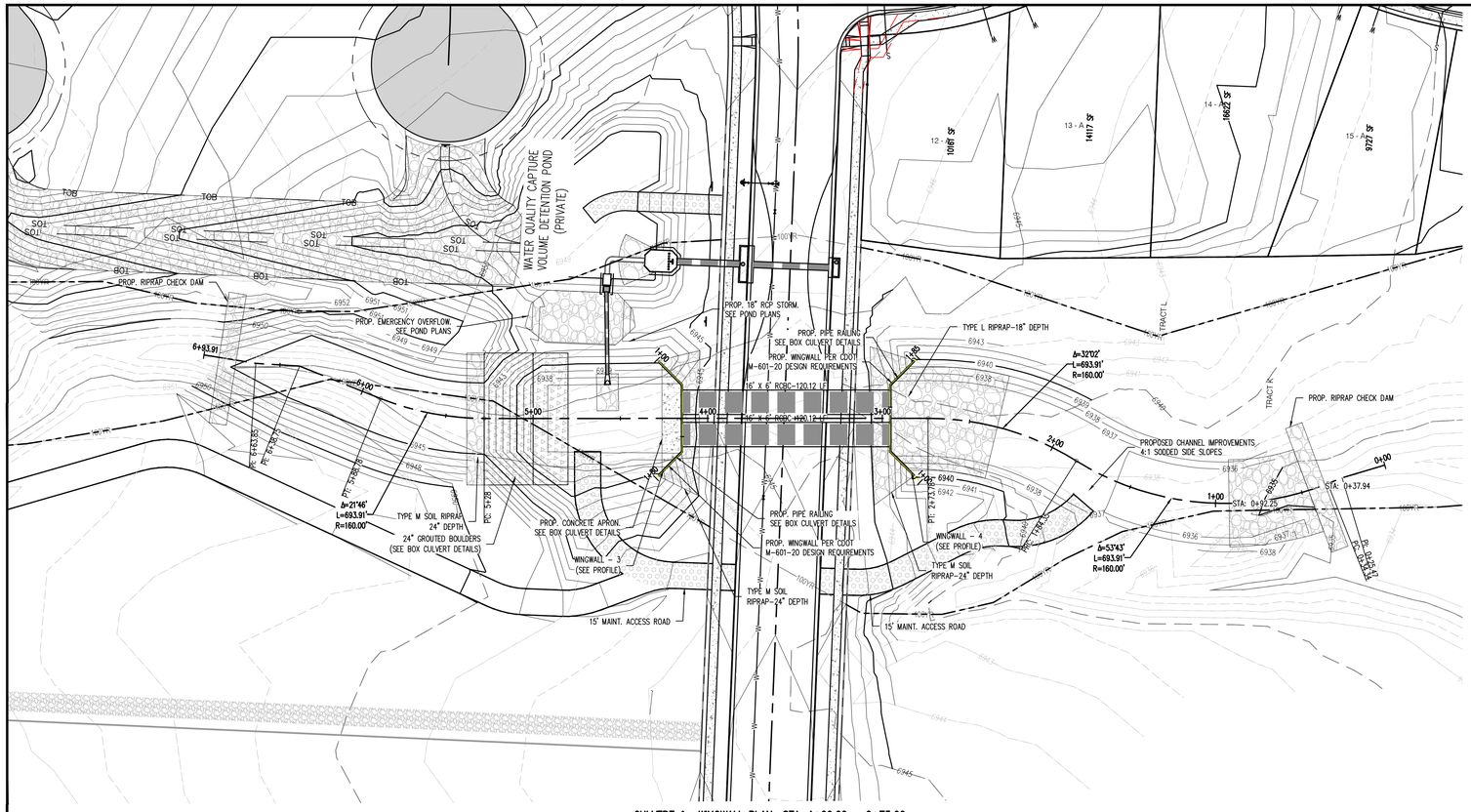
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BOX CULVERT PLAN & PROFILE

ASB2514

C4.05
Sheet 30 of 38

M:\Civil\Challenger Homes Inc\COS, El Paso County (CLH000014 Jeffrey\Drawing\CAD\C4.05 BOX Culvert PLAN & PROFILE.dwg, Tyler Nesbitt, 3/17/2026



CULVERT & WINGWALL PLAN: STA. 1+00.00 – 6+75.00
SCALE: 1"=40'

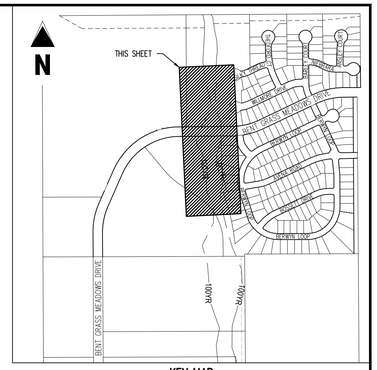
LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 100YR — 100 – YR FLOODPLAIN LINE
- TOS — TOE OF SLOPE
- TOB — TOP OF BANK
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- GROUTED BOULDERS
- GRAVEL (CDOT CLASS 6)
- RIPRAP
- ASPHALT PAVING

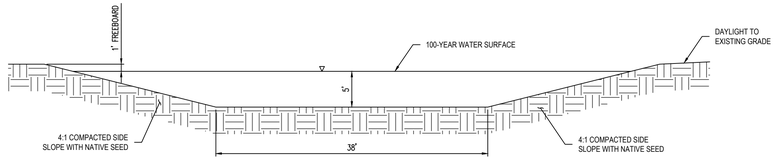
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NOTE

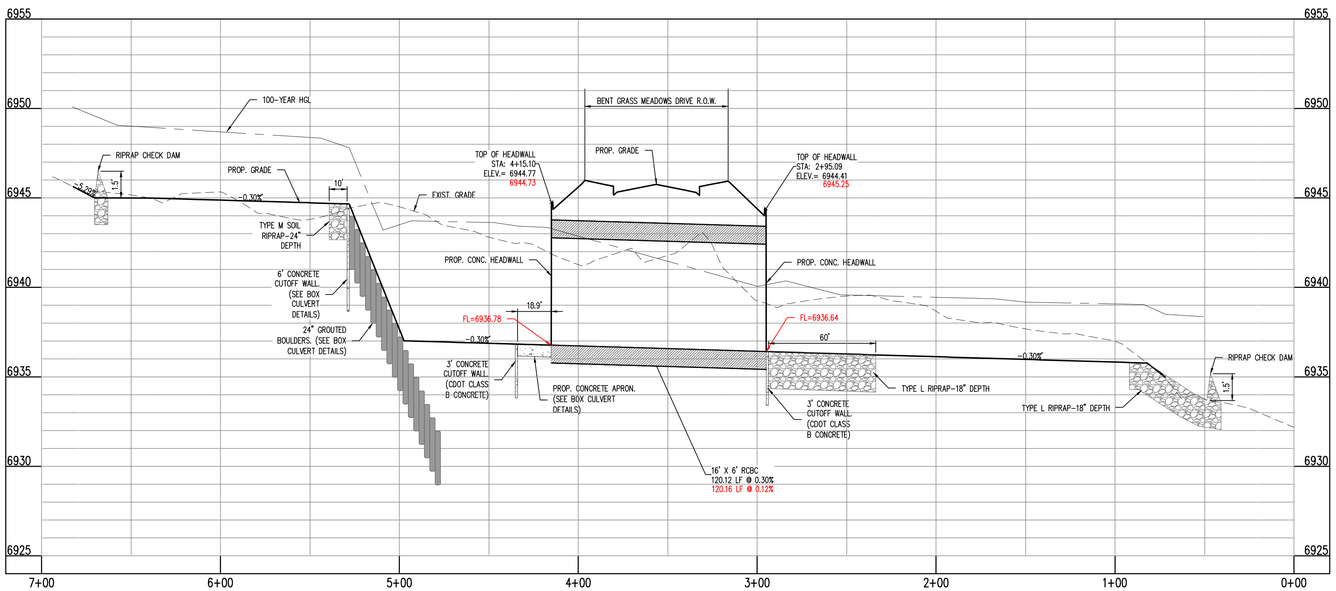
UNLESS OTHERWISE NOTED, ALL RIPRAP SHOWN IS TO BE TYPE L–18" DEPTH.



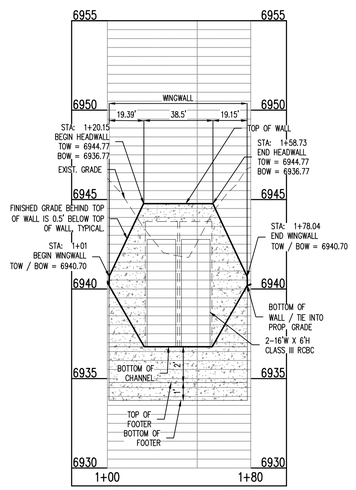
KEY MAP
SCALE: 1"=600'



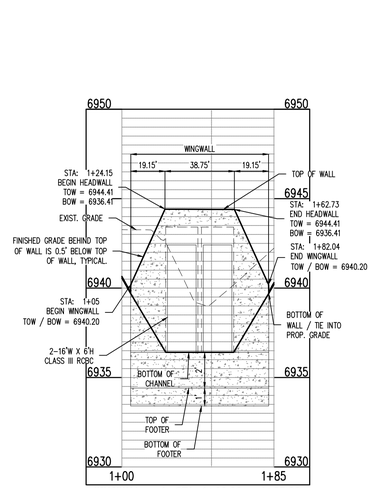
CULVERT CHANNEL TYPICAL SECTION
SCALE: 1"=10'



CULVERT & WINGWALL PROFILE: STA. 0+00.00 – 7+00.00
SCALE: H:1"=40', V:1"=4'



WINGWALL – 3: STA. 1+00.00 – 1+80.00
SCALE: H:1"=40', V:1"=4'



WINGWALL – 4: STA. 1+00.00 – 1+85.00
SCALE: H:1"=40', V:1"=4'

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COLORADO REGISTERED PROFESSIONAL ENGINEER 38164 03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

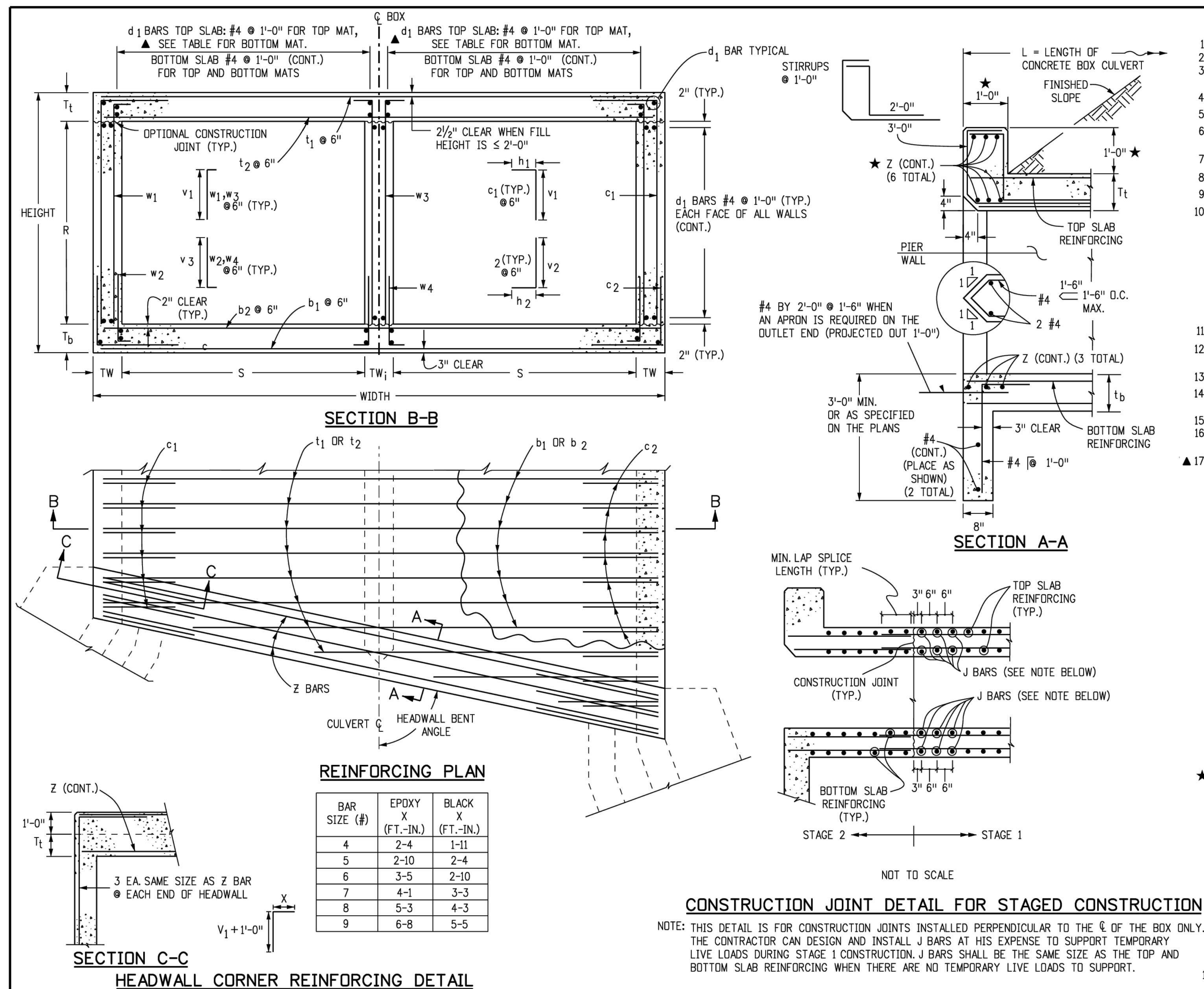
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

CULVERT & WINGWALL PLAN & PROFILE

ASB2514

C4.06
Sheet 31 of 38

H:\Challenger Homes Inc\03- El Paso County\CLH000014.20 Bent Grass\Civil\CAD\13 CDSS Bent Grass\Civil\13_01_Bent Grass_RDP.dwg, Sara Nicolai, 3/13/2026



BAR SIZE (#)	EPOXY X (FT.-IN.)	BLACK X (FT.-IN.)
4	2-4	1-11
5	2-10	2-4
6	3-5	2-10
7	4-1	3-3
8	5-3	4-3
9	6-8	5-5

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS D (BOX CULVERT).
2. ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS PLACED.
3. ALL CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS SHALL BE CONSTRUCTED ONLY IF APPROVED BY THE ENGINEER.
4. THE CONTRACTOR SHALL MAINTAIN THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.
5. STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH STANDARD PLAN M-206-1.
6. FOR ANY CULVERT SPAN 20 FT. OR GREATER, A FOUNDATION INVESTIGATION AND REPORT ARE REQUIRED.
7. BACKFILL SHALL NOT BEGIN UNTIL TOP SLAB HAS REACHED DESIGN STRENGTH, f'c.
8. SPLICE QUANTITIES FOR LONGITUDINAL AND TRANSVERSE BARS ARE NOT INCLUDED.
9. REINFORCING STEEL SHALL BE GRADE 60.
10. THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

THE ABOVE SPLICE LENGTHS ARE FOR CLASS B SPLICES.

11. ALL DIMENSIONS ARE PERPENDICULAR TO THE CENTERLINE OF THE BOX.
12. WINGWALLS SHALL BE TIED TO CONCRETE BOX CULVERT IN ACCORDANCE WITH STANDARD PLAN M-601-20.
13. ALL TRANSVERSE REINFORCING SHALL BE NORMAL TO THE CENTERLINE OF THE BOX.
14. THE FILL HEIGHT IS THE DISTANCE MEASURED FROM THE TOP OF THE TOP SLAB TO THE TOP OF PAVEMENT.
15. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾".
16. FOR FILL HEIGHTS LESS THAN 2 FT, A WATERPROOFING MEMBRANE SHALL BE PROVIDED FOR THE TOP OF THE TOP SLAB AND 18" DOWN ALONG THE TOPS OF THE EXTERIOR WALLS.

▲17. FOR FILL HIEGHTS LESS THAN 2 FT, THE d_1 BARS FOR THE BOTTOM MAT OF THE TOP SLAB SHALL BE AS FOLLOWS:

S	6, 8	10, 12, 16	14, 18	20
BAR SIZE:	#4	#5	#6	#7
SPACING	0'-6"	1'-0"	1'-2"	1'-2"

DESIGN DATA: 7TH EDITION, 2014, OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
RATING DATA: 2ND EDITION, 2011, OF THE AASHTO MANUAL FOR BRIDGE EVALUATION

LOADING DATA: f_y = 60,000 psi., f'_c = 4,500 psi.,

LIVE LOAD = AASHTO LRFD, HL-93 TRUCK, HL-93 TANDEM, COLORADO PERMIT TRUCK AND NRL

DEAD LOAD CASE 1: VERTICAL EARTH LOAD = 120 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 30 LBS./CU.FT.

DEAD LOAD CASE 2: VERTICAL EARTH LOAD = 120 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 60 LBS./CU. FT.

WEARING SURFACE - 12 IN. THICK CONCRETE PAVEMENT.
DEAD LOAD - TYPE 7 BARRIER.
THRUST IS NOT CONSIDERED IN THIS STANDARD, I.E. THRUST = 0.
EXTREME HEADWATER TO DEPTH RATIO IS IN ACCORDANCE WITH THE CDOT DRAINAGE MANUAL.
EXTREME HEADWATER TO DEPTH RATIO WAS INCLUDED IN THE CULVERT DESIGNS BUT EXCLUDED FROM THE RATINGS AS PER THE AASHTO MANUAL FOR BRIDGE EVALUATION.
LIVE LOAD SURCHARGE ON EXTERIOR WALLS = 2 FT. OF EARTH

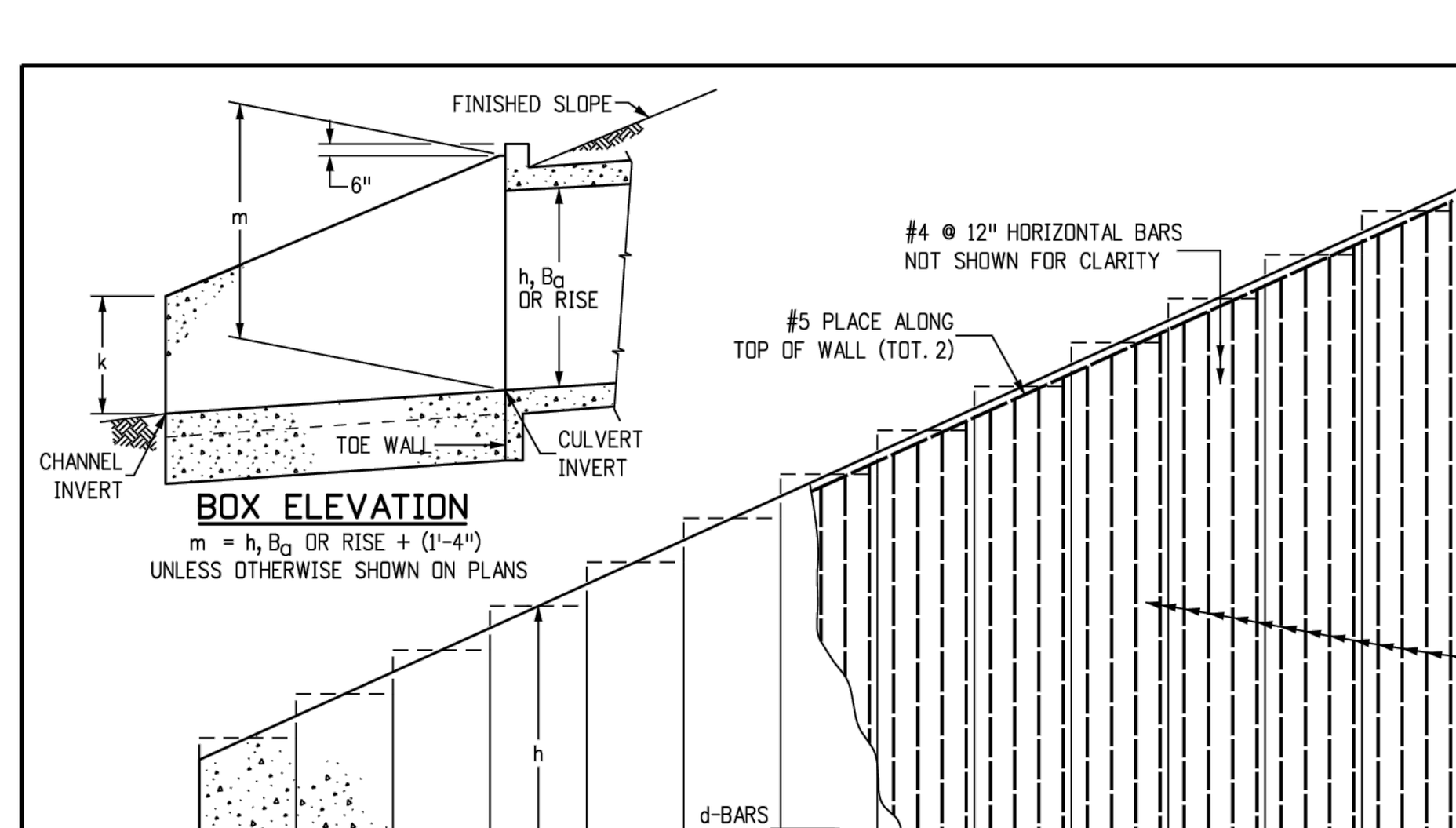
★ IF HEADWALL MOUNT GUARDRAIL IS USED (SEE STANDARD PLAN M-606-1, SHEET 19) AND THE NOTES BELOW:
- ALL REINFORCING STEEL SHALL BE ACCORDING TO THIS BOX CULVERT PLAN.
- ANY SPECIAL DESIGN FOR STIRRUPS WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
- HEADWALL DIMENSION AND CONCRETE QUANTITY SHALL BE ACCORDING TO STANDARD PLAN M-606-1, SHEET 19.
- POST ANCHORS SHALL BE PROVIDED ACCORDING TO STANDARD PLAN M-606-1, SHEET 19.
- POST ANCHORS AND CONCRETE FOR HEADWALL MOUNT OF GUARDRAIL WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
- POST ANCHORS WHEN REQUIRED AND ENCASED IN HEADWALL CONCRETE, SHALL CONFORM TO ASTM A 36 OR AASHTO M 169 STEEL.

18. SEE M-603-3 FOR PRECAST CONCRETE BOX CULVERT DETAILS.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: DDG	Date:	Comments
Last Modification Date: 04/05/19	Initials: JBE	08/27/13	LRFD Design
Full Path: www.codot.gov/business/designsupport		08/01/15	Analysis Program Updates
Drawing File Name: 601020102.dgn		04/05/19	Clarified this sheet is for Cast-In-Place CBC only, not for Pre-Cast CBC. Changed title and added Gen. Note 18.
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English			

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2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Division of Project Support DDG/Bridge

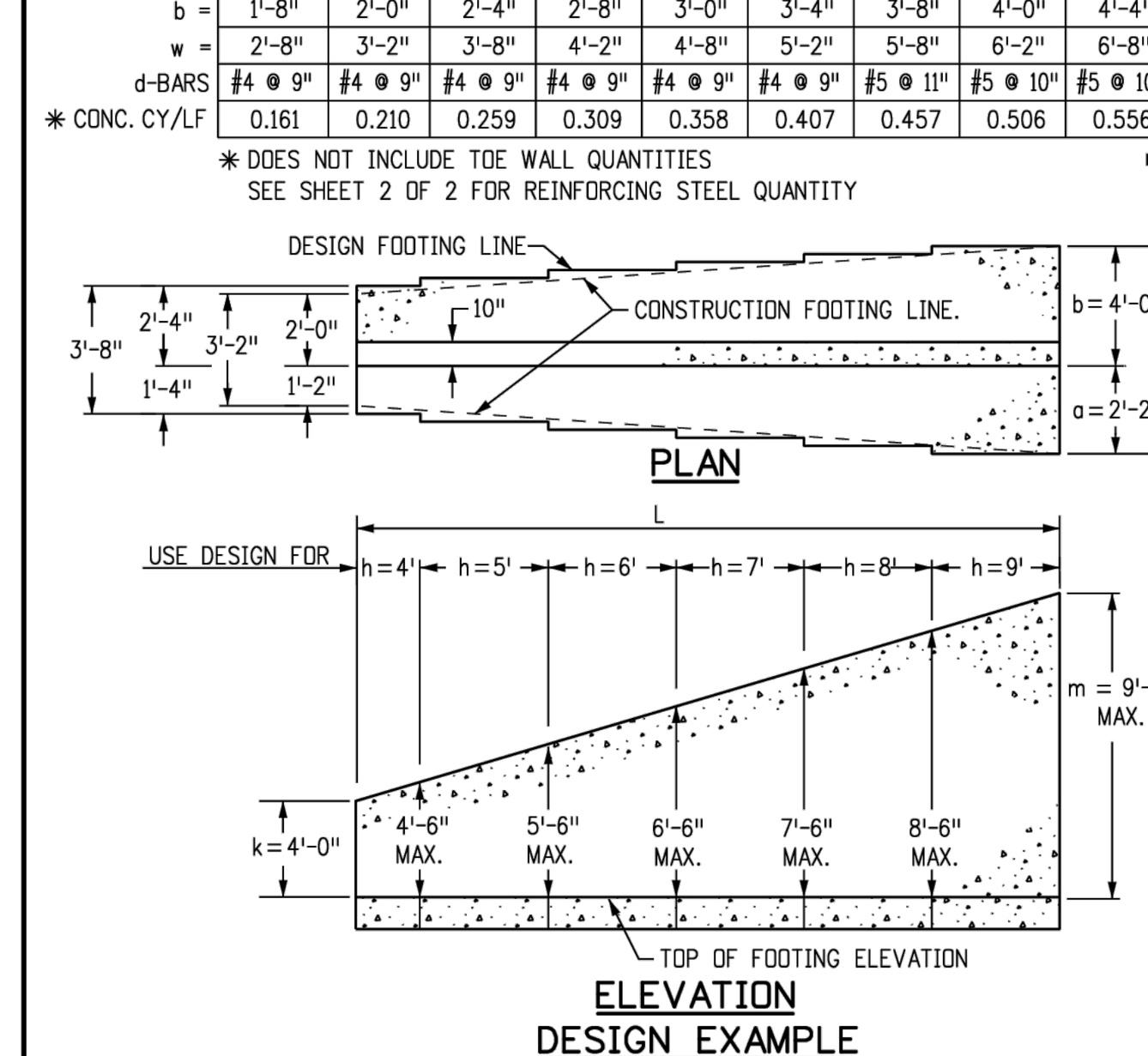
DOUBLE CONCRETE BOX CULVERT (CAST-IN-PLACE)
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-601-2
Sheet No. 1 of 2

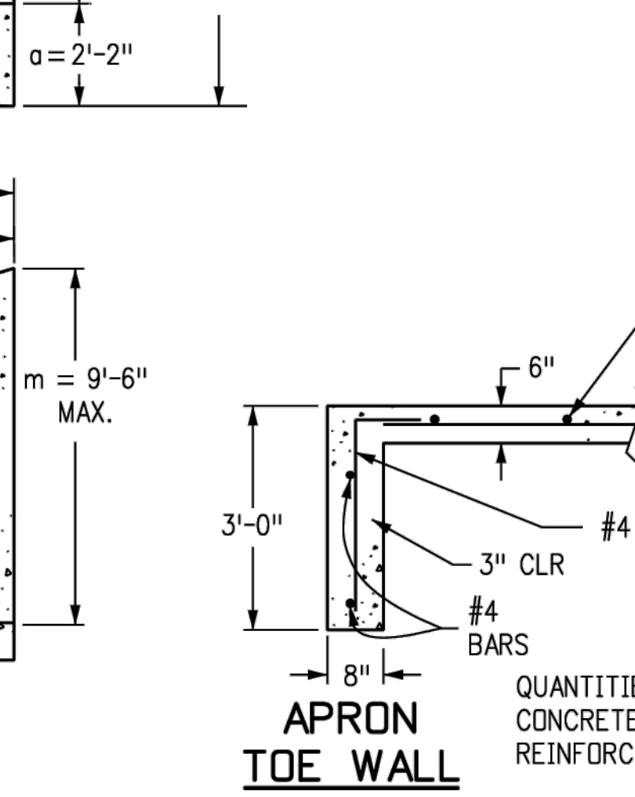


h =	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	■ 12'	■ 13'	■ 14'
a =	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	2'-8"	2'-10"	3'-0"
b =	1'-8"	2'-0"	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-0"	5'-4"	5'-8"
w =	2'-8"	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	7'-8"	8'-2"	8'-8"
d-BARS	#4 @ 9"	#4 @ 9"	#4 @ 9"	#4 @ 9"	#4 @ 9"	#4 @ 9"	#5 @ 11"	#5 @ 10"	#5 @ 10"	#5 @ 8"	#6 @ 8"	#7 @ 9"	#7 @ 7"
✳ CONC. CY/LF	0.161	0.210	0.259	0.309	0.358	0.407	0.457	0.506	0.556	0.605	0.654	0.704	0.753

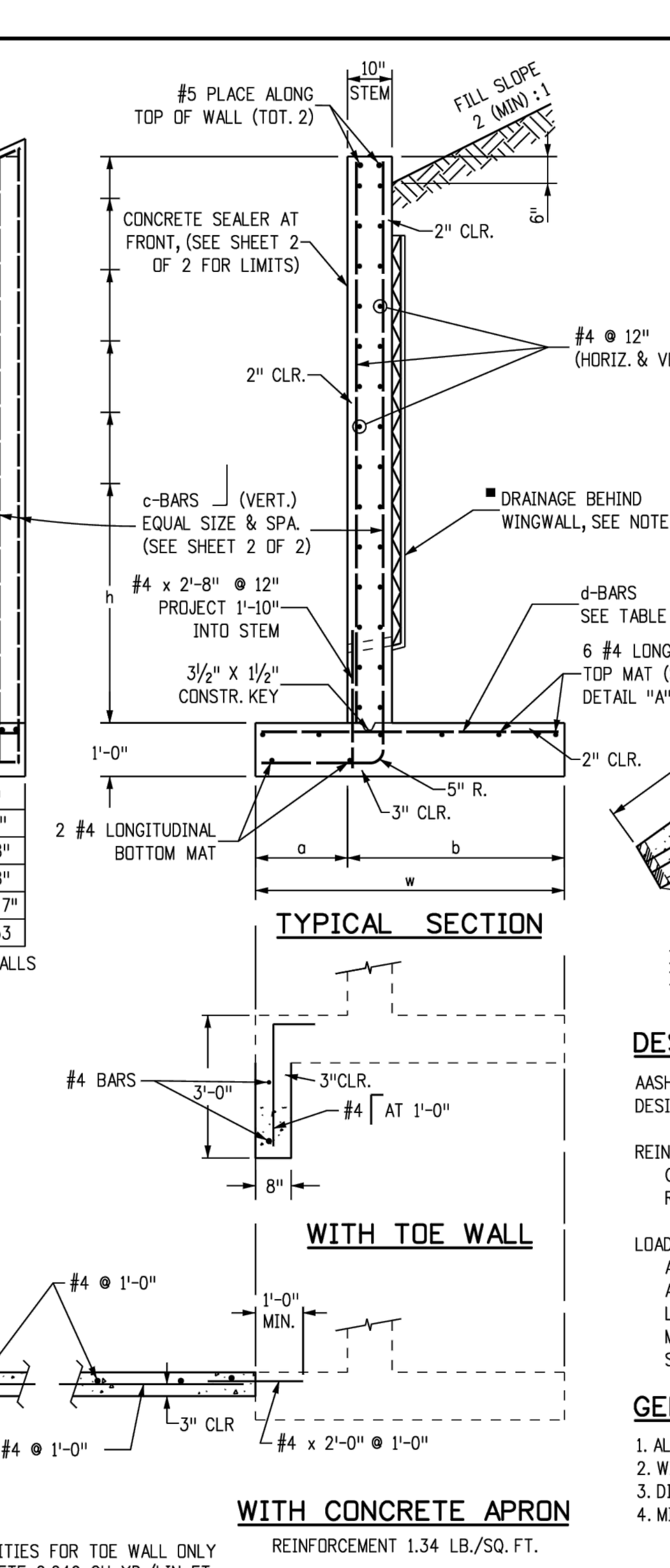
✳ DOES NOT INCLUDE TOE WALL QUANTITIES
SEE SHEET 2 OF 2 FOR REINFORCING STEEL QUANTITY

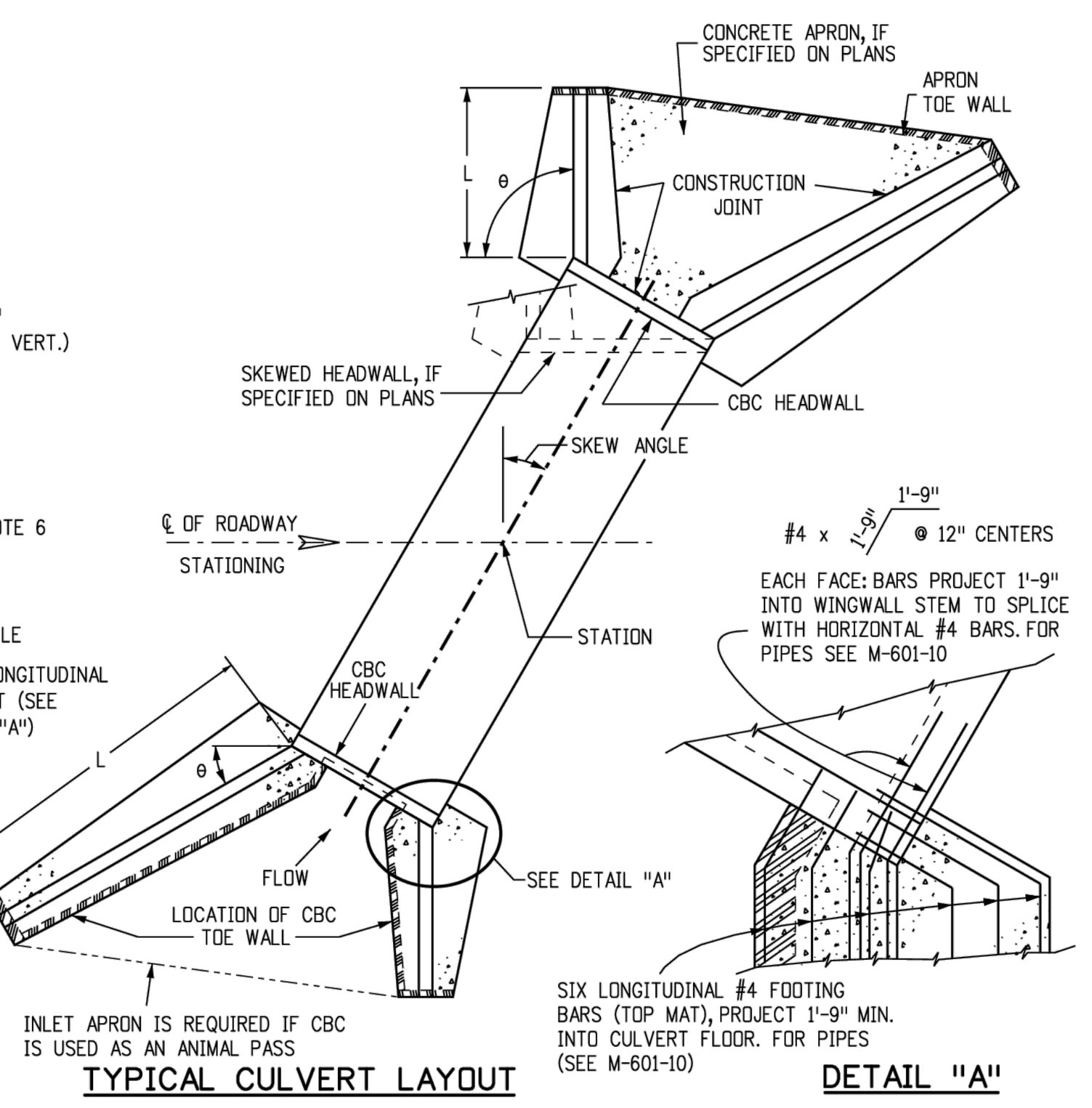
■ REQUIRED DRAINAGE BEHIND WINGWALLS
SEE NOTE 6





QUANTITIES FOR TOE WALL ONLY
CONCRETE 0.049 CU. YD./LIN. FT.
REINFORCEMENT 5.1 LB./LIN. FT.





DESIGN DATA:

AASHTO LRFD EIGHTH EDITION, 2017
DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN, YIELD LINE METHOD

REINFORCED CONCRETE:
CONCRETE CLASS D (BOX CULVERT): f'_c = 4,500 PSI
REINFORCING STEEL: f_y = 60,000 PSI

LOADING:
AT-REST EARTH (FLUID) PRESSURE FOR CONCRETE STEM DESIGN = 55 PCF FOR 2 (MIN.) : 1 SLOPED BACKFILL
ACTIVE EARTH (FLUID) PRESSURE FOR CONCRETE FOOTING DESIGN = 40 PCF FOR 2 (MIN.) : 1 SLOPED BACKFILL
LIVE LOAD SURCHARGE = 2'
MINIMUM RESISTANCE FOR SOIL BEARING = 5.5 KSF
SOIL BEARING RESISTANCE FACTOR = 0.45

GENERAL NOTES:

1. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.
2. WINGWALL FOOTING AND FLOOR OF BOX CULVERT SHALL BE PLACED MONOLITHICALLY.
3. DIMENSIONS "h", "k", "L", "m" AND ANGLE "θ" FOR WINGWALL SHALL BE AS SHOWN ON THE PLANS.
4. MINIMUM CLASS B LAP SPLICE LENGTH FOR BLACK REINFORCING BARS:

BAR SIZE:	#4	#5	#6	#7
SPLICE LENGTH:	1'- 6"	1'-11"	2'-3"	2'-7"

5. DESIGN DOES NOT CONSIDER ANY SCOUR EFFECTS.
6. WINGWALL DRAIN SHALL BE REQUIRED IF "h" ≥ 12.0 FT., SEE SHEET 2 OF 2 FOR DETAILS.

Computer File Information		Sheet Revisions	
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WINGWALLS FOR PIPE OR BOX CULVERTS
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-601-20
Sheet No. 1 of 2

DOUBLE CONCRETE BOX CULVERT DIMENSIONS, QUANTITIES & RATING FACTORS (EXCLUDING HEADWALL & TOEWALL QUANTITIES)

BOX SIZE S	BOX SIZE R	HT.	WIDTH	FILL HEIGHT ALLOWED	T_t	T_b	TW & TW_i	t_1*	t_2	b_1	b_2	w_1* & w_2	w_3* & w_4	c_1*	c_2	d_1▲	h_1	h_2	v_1	v_2	v_3	CONCRETE	REBAR STL	MEMBRANE	HL-93 INVENTORY	HL-93 OPERATING	COLORADO PERMIT	NRL VEHICLE
FT	FT	FT-IN	FT-IN	FT-FT	SLAB & WALL THICKNESS (INHES)			#	#	#	#	#	#	#	#	NO.	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	CY/LF	LBS/LF	CY/LF				
6	6	7-9	14-6	< 2	11	10	10	5	6	5	6	4	4	5	5	114	3-5	2-4	6-8	3-1	1-11	1.495	338	1.944	1.27	1.65	2.09	2.05
		7-7.5	14-6	2 TO 10	10	9.5	10	5	5	5	5	4	4	5	5	102	2-6	2-4	6-8	3-1	1-11	1.428	300		1.81	2.35	2.90	2.82
		7-7.5	14-6	10 TO 12.8	10	9.5	10	4	4	4	4	4	4	5	5	102	2-6	2-4	6-8	3-1	1-11	1.428	258		4.53	5.88	6.42	7.36
		7-8	14-6	12.8 TO 20	10	10	10	4	4	4	4	4	4	5	5	102	2-6	2-4	6-8	3-1	1-11	1.451	258		◆	◆	◆	◆
	8	9-9	14-6	< 2	11	10	10	5	6	5	6	4	4	5	5	126	3-5	2-4	8-8	3-1	1-11	1.681	365	1.944	1.28	1.66	2.10	2.05
		9-7.5	14-6	2 TO 10	10	9.5	10	5	5	5	5	4	4	5	5	114	2-6	2-4	8-8	3-1	1-11	1.613	327		1.82	2.36	2.85	2.77
		9-7.5	14-6	10 TO 12.8	10	9.5	10	4	4	4	4	4	4	5	5	114	2-6	2-4	8-8	3-1	1-11	1.613	285		4.66	6.04	6.82	5.08
		9-8	14-6	12.8 TO 20	10	10	10	4	5	5	5	4	4	5	5	114	2-6	2-4	8-8	3-1	1-11	1.636	317		◆	◆	◆	◆
	10	11-9	14-6	< 2	11	10	10	5	6	5	6	4	4	5	5	138	3-5	2-4	10-8	3-1	1-11	1.866	392	1.944	1.28	1.67	1.00	2.06
		11-7.5	14-6	2 TO 10	10	9.5	10	5	5	5	5	4	4	5	5	126	2-6	2-4	10-8	3-1	1-11	1.799	354		1.83	2.38	1.00	2.78
		11-7.5	14-6	10 TO 12.8	10	9.5	10	4	4	4	4	4	4	5	5	126	2-6	2-4	10-8	3-1	1-11	1.799	312		2.22	2.88	2.79	1.96
		11-8.5	14-10.5	12.8 TO 20	10	10.5	11.5	4	5	4	5	4	4	5	5	126	2-6	2-4	10-8	3-2	2-0	2.006	336		◆	◆	◆	◆
8	6	7-10.5	18-6	< 2	12.5	10	10	5	6	5	6	4	4	5	5	134	3-5	2-4	6-10	3-1	1-11	1.840	394	2.389	1.20	1.56	1.76	1.65
		7-8	18-6	2 TO 10	10	10	10	5	5	5	5	4	4	5	5	118	2-6	2-4	6-8	3-1	1-11	1.698	344		1.47	1.90	2.19	2.15
		7-10	18-6	10 TO 15	10	12	10	5	4	5	5	4	4	5	5	118	2-6	2-4	6-8	3-3	2-1	1.812	332		2.89	3.74	4.00	4.38
		7-11	18-9	15 TO 16.8	10.5	12.5	11	5	4	5	5	4	4	5	5	118	2-6	2-5	6-8	3-4	2-2	1.942	335		3.37	4.37	4.60	4.86
		7-11	18-9	16.8 TO 20	10.5	12.5	11	5	4	5	5	4	4	5	5	118	2-6	2-4	6-8	3-4	2-2	1.942	335		◆	◆	◆	◆
	8	9-10.5	18-6	< 2	12.5	10	10	5	6	5	6	4	4	5	5	146	3-5	2-4	8-10	3-1	1-11	2.025	421	2.389	1.21	1.57	1.71	1.61
		9-8	18-6	2 TO 10	10	10	10	5	5	5	5	4	4	5	5	130	2-6	2-4	8-8	3-1	1-11	1.883	371		1.46	1.89	2.18	2.13
		9-10	18-6	10 TO 15	10	12	10	5	4	5	5	4	4	5	5	130	2-6	2-4	8-8	3-3	2-1	1.997	359		2.96	3.83	4.10	4.37
		9-11	18-9	15 TO 16.8	10.5	12.5	11	5	4	5	5	4	4	5	5	130	2-6	2-5	8-8	3-4	2-2	2.146	362		3.44	4.46	4.70	4.96
		9-11	18-9	16.8 TO 20	10.5	12.5	11	5	4	5	5	4	4	5	5	130	2-6	2-5	8-8	3-4	2-2	2.146	362		◆	◆	◆	◆
10	6	8-0.5	22-6	< 2	13.5	11	10	5	6	5	6	4	4	5	5	134	3-5	2-4	6-11	3-2	2-0	2.257	444	2.833	1.15	1.49	1.65	1.49
		8-1.5	22-6	2 TO 5	13	12.5	10	5	6	5	6	4	4	5	5	134	2-6	2-4	6-11	3-4	2-2	2.326	434		1.52	1.98	1.82	1.84
		8-2	22-6	5 TO 10	13	13	10	5	4	6	6	4	4	5	5	134	2-6	2-4	6-11	3-5	2-2	2.361	417		1.77	2.29	2.65	3.77
		8-2.5	22-9	10 TO 15	13	13.5	11	6	5	6	6	5	5	5	5	134	2-6	2-5	6-11	3-5	2-7	2.472	495		3.57	4.63	4.62	5.05
		8-5.5	23-0	15 TO 20	14	15.5	12	6	5	6	6	5	5	5	5	134	2-6	2-6	7-0	3-7	2-9	2.761	501		3.36	4.36	4.38	4.52
	8	10-1	22-6	< 2	14	11	10	5	6	5	6	4	4	5	5	146	3-5	2-5	8-11	3-2	2-0	2.477	472	2.833	1.22	1.58	1.60	1.44
		10-1.5	22-6	2 TO 5	13	12.5	10	5	6	5	6	4	4	5	5	146	2-6	2-4	8-11	3-4	2-2	2.512	461		1.52	1.97	1.79	1.79
		10-3	22-6	5 TO 10	13	14	10	5	4	5	6	4	4	5	5	146	2-6	2-4	8-11	3-5	2-3	2.616	425		1.74	2.25	2.61	3.53
		10-3	22-9	10 TO 15	13	14	11	6	5	6	5	5	5	5	5	146	2-6	2-5	8-11	3-5	2-7	2.711	508		3.95	5.12	5.26	5.69
		10-5.5	23-0	15 TO 20	14	15.5	12	6	5	6	6	6	6	5	5	146	2-6	2-6	9-0	3-7	2-9	2.983	588		3.46	4.48	4.51	4.64
	10	12-2	22-6	< 2	14	12	10	5	6	5	6	4	4	5	5	158	3-5	2-5	10-11	3-3	2-1	2.731	499	2.833	1.24	1.60	1.79	1.61
		12-2	22-6	2 TO 5	13	13	10	5	6	5	6	4	4	5	5	158	2-6	2-4	10-11	3-4	2-2	2.731	488		1.64	2.12	1.89	1.88
		12-3	22-6	5 TO 10	13	14	10	5	4	5	6	4	4	5	5	158	2-6	2-4	10-11	3-5	2-3	2.801	452		1.72	2.23	2.58	2.74
		12-5.5	22-9	10 TO 15	14	15.5	11	5	6	6	4	5	5	5	5	158	2-6	2-5	11-0	3-7	2-9	3.090	527		2.42	3.14	3.18	2.25
		12-5.5	23-0	15 TO 20	14	15.5	12	6	5	6	6	5	5	5	5	158	2-6	2-5	11-0	3-7	2-9	3.205	567		2.11	2.73	2.64	1.86
12	6	8-3.5	26-6	< 2	14.5	13	10	5	6	5	6	4	4	5	5	150	3-5	2-5	7-0	3-4	2-2	2.805	500	3.278	1.16	1.51	1.51	1.59
		8-5	26-6	2 TO 5	14	15	10	5	6	6	6	4	4	5	5	150	2-6	2-4	7-0	3-6	2-4	2.927	512		1.22	1.59	1.43	1.54
		8-5.5	26-6	5 TO 10	14	15.5	10	6	5	6	6	4	4	5	5	150	2-6	2-4	7-0	3-6	2-5	2.968	488		2.10	2.72	3.13	3.89
		8-6.5	26-9	10 TO 15	15	15.5	11	6	6	7	6	5	5	5	5	150	3-3	2-5	7-1	3-7	2-9	3.129	610		1.86	2.42	2.36	2.53
	8	10-4	26-6	< 2	14.5	13.5	10	5	6	5	6	4	4	5	5	162	3-5	2-5	9-0	3-5	2-3	3.031	528	3.278	1.16	1.51	1.56	1.59
		10-5.5	26-6	2 TO 5	14	15.5	10	5	6	5	6	4	4	5	5	162	2-6	2-4	9-0	3-7	2-5	3.154	515		1.22	1.58	1.43	1.51
		10-7.5	26-6	5 TO 10	16	15.5	10	5	6	6	6	4	4	5	5	162	3-3	2-4	9-2	3-7	2-5	3.317	544		1.70	2.21	2.16	2.39
		10-7.5	26-9	10 TO 15	16	15.5	11	6	6	7	6	5	5	5	5	162	3-3	2-5	9-2	3-7	2-9	3.416	644		2.83	3.67	3.54	3.80
	10	12-5	26-6	< 2	15	14	10	5	6	5	6	4	4	5	5	174	3-9	2-5	11-0	3-5	2-3	3.298	556	3.278	1.23	1.60	1.66	1.69
		12-5.5	26-6	2 TO 5	14	15.5	10	5	6	5	6	4	4	5	5	174	2-6	2-5	11-0	3-7	2-5	3.339	543		1.22	1.58	1.43	1.52
		12-7.5	26-6	5 TO 10	16	15.5	10	5	6	6	6	4	4	5	5	174	3-3	2-4	11-2	3-7	2-5	3.502	571		1.82	2.36	2.31	2.56
		12-7.5	26-9	10 TO 15	16	15.5	11	6	6	7	6	5	5	5	5	174	3-3	2-5	11-2	3-7	2-9	3.619	678		2.33	3.02	2.92	2.08
14	6	8-5.5	30-6	< 2	15.5	14	10	6	7	6	7	5	5	6	6	166	4-4	2-9	7-1	3-9	2-7	3.333	766	3.722	1.15	1.49	1.54	1.53
		8-4.5	30-6	2 TO 5	14	14.5	10	6	7	6	7	5	5	6	6	166	2-10	2-8	7-0	3-10	2-8	3.238	731		1.28	1.66	1.41	1.50
		8-6.5	30-6	5 TO 10	15.5	15	10	6	7	7	7	5	5	6	6	166	3-8	2-8	7-1	3-10	2-8	3.427	770		1.37	1.78	1.65	1.83
		8-8	30-6	10 TO 12	16	16	10	7	6	7	7	5	5	6	6	166	3-8	2-9	7-2	3-11	2-9	3.568	773		2.27	2.95	2.50	2.66
	8	10-5.5	30-6	< 2	15.5	14	10	6	7	6	7	5	5	6	6	178	4-4	2-9	9-1	3-9	2-7	3.518	803	3.722	1.15	1.49	1.49	1.50
		10-4.5	30-6	2 TO 5	14	14.5	10	6	7	6	7	5	5	6	6	178	2-10	2-8	9-0	3-10	2-8	3.424	768		1.26	1.64	1.38	1.46
		10-6.5	30-6	5 TO 10	15.5	15	10	6	7	7	7	5	5	6	6	178	3-8	2-8	9-1	3-10	2-8	3.612	807		1.37	1.77	1.65	1.83
		10-8.5	30-6	10 TO 12	16	16.5	10	7	5	7	7	5	5	6	6	178	3-8	2-8	9-2	4-0	2-10	3.800	783		1.46	1.90	2.09	2.27
	10	12-5.5	30-6	< 2	15.5	14	10	6	7	6	7	5	5	6	6	190	4-4	2-9	11-1	3-9	2-7	3.703	839	3.722	1.15	1.50	1.46	1.48
		12-5	30-9	2 TO 5	14	15	11	6	7	6	7	5	5	6	6	190	2-10	2-9	11-0	3-10	2-8	3.771	809		1.30	1.69	1.42	1.57
		12-6.5	30-6	5 TO 7	15.5	15	10	6	5	7	7	5	5	6	6	190	3-8	2-8	11-1	3-10	2-8	3.797	783		1.49	1.93	2.18	2.78
		12-8.5	30-6	7 TO 12	16	16.5	10	7	5	7	7	5	5	6	6	190	3-8	2-8	11-2	4-0	2-10	3.985	820		1.47	1.91	2.11	2.02
16	6	8-6.5	34-9	< 2	16	14.5	11	6	7	6	7	5	5	6	6	182	4-4	2-9	7-1	3-9	2-8	3.882	825	4.194	1.12	1.46	1.44	1.44
		8-5	34-6	2 TO 5	14	15	10	7	6	6	7	5	5	6	6	182	2-10	2-8	7-0	3-10	2-8	3.644	799		1.00	1.29	1.09	1.02
		8-6	34-6	5 TO 7	14	16	10	7	6	7	6	5	5	6	6	182	2-10	2-8	7-0	3-11	2-9	3.750	800		1.66	2.16	1.94	2.21
		8-7.5	34-9	7 TO 10	15.5	16	11	7	6	8	6	5	5	6	6	182	3-8	2-9	7-1	3-11	2-9	3.990	853		1.64	2.13	1.89	2.06
	8	10-7.5	34-9	< 2	16.5	15	11	6	7	6	7	5	5	6	6	194	4-4	2-9	9-2	3-10	2-8	4.193	864	4.194	1.18	1.54	1.45	1.46
		10-6	34-6	2 TO 5	15	15	10	8	6	7	6	5	5	6	6	194	2-10	2-8	9-1	3-10	2-8	3.935	880		1.02	1.32	1.42	1.36
		10-7	34-6	5 TO 7	15	16	10	8	6	7	6	5	5	6	6	194	2-10	2-8	9-1	3-11	2-9	4.042	881		1.72	2.23	2.23	2.13
		10-8	34-9	7 TO 10	15.5	16.5	11	7	6	8	6	5	5	6	6	194	3-8	2-9	9-1	4-0	2-10	4.247	891		1.60	2.07	1.84	2.00
	10	12-7.5	34-9	< 2	16.5	15	11	6	7	6	7	5	5	6	6	206	4-4	2-9	11-2	3-10	2-8	4.397	901	4.194	1.19	1.54	1.41	1.42
		12-6.5	34-6	2 TO 5	15.5	15	10	8	6	7	6	5	5	6	6	206	2-10	2-8	11-1	3-10	2-8	4.174	916		1.02	1.33	1.43	1.37
		12-7.5	34-6	5 TO 7	15.5	16	10	8	6	7	6	5	5	6	6	206	2-10	2-8	11-1	3-11	2-9	4.280	918		1.74	2.26	2.23	2.12
18	6	8-8	38-9	< 2	17	15	11	7	8	7	8	5	5	6	6	198	4-4	2-10	7-2	3-10	2-9	4.438	1094	4.639	1.14	1.47	1.27	1.32
		8-6.5	38-9	2 TO 5	15	15.5	11	8	8	8	8	5	5	6	6	198	3-8	2-9	7-1	3-11	2-9	4.259	1153		1.32	1.71	1.73	1.65
		8-7.5	38-9	5 TO 7	15.5	16	11	8	8	8	8	5	5	6	6	198	3-8	2-9	7-1	3-11	2-9	4.378	1153		2.23	2.89	2.57	2.58
	8	10-9	38-9	< 2	17.5	15.5	11	7	8	7	8	5	5	6	6	210	4-4	2-9	9-3	3-10	2-9	4.762	1132	4.639	1.19	1.55	1.28	1.33
		10-7	38-9	2 TO 5	15	16	11	8	9	8	9	5	5	6	6	210	3-8	2-9	9-1	3-11	2-9	4.522	1302		1.47	1.90	1.80	1.83
		10-7	38-9	5 TO 7	15	16	11	8	9	8	9	5	5	6	6	210	3-8	2-9	9-1	3-11	2-9	4.522	1302		2.20	2.85	2.45	2.46
	10	12-9	38-9	< 2	17.5	15.5	11	7	8	7	8	5	5	6	6	222	4-4	2-9	11-3	3-10	2-9	4.965	1168	4.639	1.16	1.51	1.24	1.29
		12-7	38-9	2 TO 5	15	16	11	8	9	8	9	6	6	6	6	222	3-8	2-9	11-1	3-11	3-1	4.726	1404		1.53	1.98	1.78	1.88
		12-7	38-9	5 TO 7	15	16	11	8	9	8	9	6	6	6	6	222	3-8	2-9	11-1	3-11	3-1	4.726	1404		2.20	2.85	2.39	2.39
20	6	8-10	43-0	< 2	18	16	12	8	9	8	9	6	6	7	7	214	5-0	3-3	7-3	4-3	3-1	5.179	1546	5.111	1.16	1.51	1.22	1.31
		8-7.5	43-0	2 TO 5	15.5	16	12	8	9	8	9	6	6	7	7	214	4-3	3-3	7-1	4-4	3-1	4.847	1480		1.48	1.91	1.51	1.70
	8	10-10	43-0	< 2	18	16	12	8	9	8	9	6	6	7	7	226	5-0	3-3	9-3	4-4	3-1	5.401	1595	5.111	1.14	1.48	1.16	1.24
		10-7.5	43-0	2 TO 5	15.5	16	12	8	9	8	9	6	6	7	7	226	4-3	3-3	9-1	4-4	3-1	5.069	1528		1.52	1.97	1.46	1.68
	10	12-10.5	43-0	< 2	18	16.5	12	8	9	8	9	6	6	7	7	238	5-0	3-3	11-3	4-4	3-2	5.690	1645	5.111	1.16	1.50	1.20	1.28
		12-7.5	43-0	2 TO 5	15.5	16	12	8	9	8	9	6	6	7	7	238	5-4	3-3	11-1	4-4	3-1	5.292	1585		1.52	1.97	1.43	1.64

HEADWALL AND TOEWALL QUANTITIES

HEADWALL BENT ANGLE	90° TO 75°			74° TO 60°			59° TO 45°		
CLEAR SPAN (S)	Z	STIRRUPS	REBAR QUANT.	Z	STIRRUPS	REBAR QUANT.	Z	STIRRUPS	REBAR QUANT.
	#	#	LBS/LF	#	#	LBS/LF	#	#	LBS/LF
6	4	4	20.8	4	4	20.4	6	4	31.2
8	4	4	19.9	5	4	24.3	7	4	36.2
10	5	4	25.0	6	4	30.6	9	4 ■	57.8
12	6	4	30.0	6	4	29.6	9	5 ■	61.3
14	6	4	29.7	7	4	35.7	★	★	★
16	6	4	29.0	8	5	46.7	★	★	★
18	7	4	35.0	9	5	54.9	★	★	★
20	7	4	34.4	★	★	★	★	★	★
CONCRETE QUANTITY = 0.086 CY/LF									

NOTES

■ 1. SIX INCH SPACING AT EACH END OF THE SPAN FOR A DISTANCE OF 1/4 OF THE SPAN LENGTH; 12 INCH SPACING ELSEWHERE.

2. QUANTITIES ARE GIVEN FOR ONE HEADWALL AND ONE TOEWALL AND ARE BASED ON PER LINEAR FOOT OF HEADWALL. STEEL QUANTITIES INCLUDE ALL REINFORCING. QUANTITIES SHALL BE PAID FOR AS SHOWN ON THE PLANS.

★ 3. SKEWED HEADWALLS ARE NOT RECOMMENDED FOR THESE SPANS. A SPECIAL DESIGN IS REQUIRED.

4. FOR HEADWALL AND TOEWALL DETAILS SEE M-601-2, SHEET 1 OF 2.

5. WHEN THE FILL HEIGHTS ARE LESS THAN OR EQUAL TO 2 FT, ALL REINFORCING BARS IN THE HEADWALL, ALL REINFORCING BARS DESIGNATED BY AN ASTERISK (*), AND THE d_1 BARS IN THE TOP MAT OF THE TOP SLAB SHALL BE EPOXY COATED.

6. REINFORCING QUANTITIES INCLUDE BOTH EPOXY-COATED AND UNCOATED BARS.

7. WHEN A (RISE) R OF LESS THAN 6 FT IS REQUIRED, USE THE BAR SIZES AND THE SLAB AND WALL THICKNESSES FOR THE 6 FT RISE (IF AVAILABLE ON THE TABLE).

▲ 8. FOR SIZE AND SPACING OF THE BOTTOM MAT BARS IN THE TOP SLAB SEE TABLE ON M-601-2, SHEET 1 OF 2. ALL OTHER d_1 BARS ARE #4's AT 1'-0" SPACING. THE NUMBER OF BARS REQUIRED IS LISTED ON THIS SHEET AND INCLUDES BOTH #4 BARS AND THOSE FROM THE TABLE.

◆ 9. LIVE LOAD IS NEGLECTED AS PER AASHTO LRFD SECTION 3.6.1.2.6. FOR THESE STRUCTURES REFER TO THE CDOT RATING MANUAL.

10. FOR ALL NEW CULVERT DESIGNS, A RATING IS REQUIRED. THE RATING SUMMARY SHEET SHOULD BE PRINTED FROM THE CDOT EXTERNAL WEBSITE AND SUBMITTED TO THE BRIDGE RATING UNIT OR INCLUDED AS PART OF A LARGER DESIGN PACKAGE. FOR ADDITIONAL INFORMATION, SEE THE CDOT RATING MANUAL.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: DDG	Date:	Comments
Last Modification Date: 04/05/19	Initials: JBE	08/27/13	LRFD Design
Full Path: www.codot.gov/business/designsupport		08/01/15	Analysis Program Updates
Drawing File Name: 601020202.dgn		04/05/19	Clarified this sheet is for Cast-In-Place CBC only, not for Pre-Cast CBC. Changed title and added Gen. Note 18.
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English			

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DOUBLE CONCRETE BOX CULVERT (CAST-IN-PLACE)
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-601-2
Sheet No. 2 of 2

c-BARS AND REINFORCING STEEL QUANTITY (EXCLUDE TOE WALL)

✳ REINFORCING STEEL QUANTITY INCLUDES STEM AND FOOTING QUANTITIES, BUT DOES NOT INCLUDE TOE WALL QUANTITIES.

m (FT)	k (FT)	≤ (1.0 x m) c-BARS	✳ REINF. LB./L.F.	≤ (1.25 x m) c-BARS	✳ REINF. LB./L.F.	≤ (1.5 x m) c-BARS	✳ REINF. LB./L.F.	≤ (1.75 x m) c-BARS	✳ REINF. LB./L.F.	≤ (2.0 x m) c-BARS	✳ REINF. LB./L.F.	≤ (2.25 x m) c-BARS	✳ REINF. LB./L.F.	≤ (2.5 x m) c-BARS	✳ REINF. LB./L.F.	≤ (2.75 x m) c-BARS	✳ REINF. LB./L.F.	≤ (3.0 x m) c-BARS	✳ REINF. LB./L.F.	≤ (3.25 x m) c-BARS	✳ REINF. LB./L.F.	≤ (3.5 x m) c-BARS	✳ REINF. LB./L.F.
14	4	#4 @ 10"	53.60	#5 @ 10"	57.95	#5 @ 10"	57.10	#5 @ 8"	60.22	#5 @ 7"	62.43	#5 @ 7"	62.09	#5 @ 6"	65.38	#5 @ 6"	65.15	#6 @ 8"	67.10	#6 @ 8"	66.94	#6 @ 7"	70.66
	5	#4 @ 10"	55.86	#5 @ 10"	60.46	#5 @ 10"	59.60	#5 @ 8"	62.89	#5 @ 7"	65.23	#5 @ 7"	64.88	#5 @ 6"	68.34	#5 @ 6"	68.11	#6 @ 8"	70.17	#6 @ 8"	70.00	#6 @ 7"	73.90
	6	#5 @ 10"	64.43	#6 @ 10"	70.60	#6 @ 10"	69.69	#6 @ 8"	74.93	#6 @ 8"	74.45	#6 @ 7"	78.30	#6 @ 6"	83.64	#6 @ 6"	83.40	#6 @ 6"	83.22	#6 @ 6"	83.05	#7 @ 7"	89.64
	7	#5 @ 10"	67.29	#6 @ 10"	73.76	#6 @ 10"	72.83	#6 @ 8"	78.32	#6 @ 8"	77.84	#6 @ 7"	81.87	#6 @ 6"	87.45	#6 @ 6"	87.21	#6 @ 6"	87.02	#6 @ 6"	86.86	#7 @ 7"	93.73
	8	#5 @ 8"	74.71	#6 @ 8"	83.46	#6 @ 7"	87.09	#6 @ 6"	92.54	#7 @ 7"	99.47	#7 @ 7"	99.08	#7 @ 6"	107.11	#7 @ 6"	106.86	#7 @ 6"	106.66	#7 @ 6"	106.49	#7 @ 6"	106.35
	9	#5 @ 8"	78.10	#6 @ 8"	87.23	#6 @ 7"	91.03	#6 @ 6"	96.72	#7 @ 7"	103.93	#7 @ 7"	103.54	#7 @ 6"	111.90	#7 @ 6"	111.65	#7 @ 6"	111.45	#7 @ 6"	111.28	#7 @ 6"	111.13
13	4	#4 @ 10"	50.51	#4 @ 10"	49.25	#5 @ 10"	53.71	#5 @ 10"	53.09	#5 @ 10"	52.36	#5 @ 9"	53.85	#5 @ 8"	55.54	#5 @ 7"	57.85	#5 @ 7"	57.67	#5 @ 7"	57.51	#6 @ 9"	59.93
	5	#4 @ 10"	52.66	#4 @ 10"	51.37	#5 @ 10"	56.09	#5 @ 10"	55.46	#5 @ 10"	54.99	#5 @ 9"	56.29	#5 @ 8"	58.08	#5 @ 7"	60.51	#5 @ 7"	60.33	#5 @ 7"	60.17	#6 @ 9"	62.72
	6	#4 @ 10"	54.92	#5 @ 10"	59.48	#5 @ 9"	60.31	#6 @ 9"	67.56	#6 @ 9"	67.08	#6 @ 9"	66.70	#6 @ 8"	69.53	#6 @ 8"	69.28	#6 @ 7"	73.12	#6 @ 7"	72.95	#6 @ 7"	72.81
	7	#4 @ 10"	57.36	#5 @ 10"	62.16	#5 @ 9"	63.05	#6 @ 9"	70.66	#6 @ 9"	70.16	#6 @ 9"	69.78	#6 @ 8"	72.75	#6 @ 8"	72.50	#6 @ 7"	76.52	#6 @ 7"	76.35	#6 @ 7"	76.20
	8	#5 @ 10"	66.39	#6 @ 10"	72.82	#6 @ 8"	77.97	#6 @ 7"	81.68	#6 @ 7"	81.19	#6 @ 6"	86.67	#6 @ 6"	86.37	#7 @ 7"	93.18	#7 @ 7"	92.97	#7 @ 7"	92.80	#7 @ 7"	92.64
	9	#5 @ 10"	69.37	#6 @ 10"	76.10	#6 @ 8"	81.49	#6 @ 7"	85.37	#6 @ 7"	84.87	#6 @ 6"	90.59	#6 @ 6"	90.29	#7 @ 7"	97.39	#7 @ 7"	97.18	#7 @ 7"	97.00	#7 @ 7"	96.85
12	2	#4 @ 10"	43.91	#4 @ 10"	42.65	#4 @ 10"	41.82	#4 @ 10"	41.22	#4 @ 10"	40.78	#4 @ 9"	41.29	#5 @ 10"	44.61	#5 @ 10"	44.37	#5 @ 10"	44.18	#5 @ 10"	44.01	#5 @ 10"	43.87
	3	#4 @ 10"	45.82	#4 @ 10"	44.55	#4 @ 10"	43.71	#4 @ 10"	43.11	#4 @ 10"	42.66	#4 @ 9"	43.22	#5 @ 10"	46.75	#5 @ 10"	46.51	#5 @ 10"	46.32	#5 @ 10"	46.15	#5 @ 10"	46.01
	4	#4 @ 10"	47.80	#4 @ 10"	46.51	#4 @ 10"	45.65	#5 @ 10"	50.06	#5 @ 10"	49.59	#5 @ 10"	49.23	#5 @ 10"	48.94	#5 @ 10"	48.69	#5 @ 9"	50.00	#5 @ 8"	51.72	#5 @ 8"	51.57
	5	#4 @ 10"	49.84	#4 @ 10"	48.53	#4 @ 10"	47.66	#5 @ 10"	52.33	#5 @ 10"	51.85	#5 @ 10"	51.48	#5 @ 10"	51.19	#5 @ 10"	50.94	#5 @ 9"	52.33	#5 @ 8"	54.14	#5 @ 8"	54.00
	6	#4 @ 10"	51.99	#4 @ 10"	50.65	#5 @ 10"	55.34	#5 @ 8"	58.41	#5 @ 8"	57.93	#6 @ 10"	60.60	#6 @ 10"	60.29	#6 @ 9"	62.42	#6 @ 9"	62.22	#6 @ 9"	62.04	#6 @ 8"	64.89
	7	#4 @ 10"	54.30	#5 @ 10"	58.80	#5 @ 10"	57.87	#5 @ 8"	61.10	#5 @ 8"	60.61	#6 @ 10"	63.43	#6 @ 10"	63.11	#6 @ 9"	65.35	#6 @ 9"	65.15	#6 @ 9"	64.97	#6 @ 8"	67.96
	8	#5 @ 10"	62.91	#5 @ 10"	61.45	#5 @ 7"	67.46	#5 @ 6"	70.68	#5 @ 6"	70.20	#6 @ 7"	76.44	#6 @ 7"	76.13	#6 @ 7"	75.87	#6 @ 6"	81.30	#6 @ 6"	81.12	#6 @ 6"	80.98
	9	#5 @ 10"	65.64	#5 @ 10"	64.15	#5 @ 7"	70.44	#5 @ 6"	73.82	#5 @ 6"	73.33	#6 @ 7"	79.86	#6 @ 7"	79.54	#6 @ 7"	79.28	#6 @ 6"	84.95	#6 @ 6"	84.77	#6 @ 6"	84.62
11	2	#4 @ 10"	41.70	#4 @ 10"	40.42	#4 @ 10"	39.57	#4 @ 10"	38.96	#4 @ 10"	38.50	#4 @ 10"	38.15	#4 @ 10"	37.87	#4 @ 10"	37.63	#4 @ 9"	38.25	#5 @ 10"	41.46	#5 @ 10"	41.31
	3	#4 @ 10"	43.57	#4 @ 10"	42.27	#4 @ 10"	41.40	#4 @ 10"	40.79	#4 @ 10"	40.33	#4 @ 10"	39.97	#4 @ 10"	39.69	#4 @ 10"	39.45	#4 @ 9"	40.12	#5 @ 10"	43.54	#5 @ 10"	43.39
	4	#4 @ 10"	45.48	#4 @ 10"	44.16	#4 @ 10"	43.28	#4 @ 10"	42.66	#4 @ 9"	43.09	#5 @ 10"	46.57	#5 @ 10"	46.27	#5 @ 10"	46.02	#5 @ 10"	45.82	#5 @ 10"	45.65	#5 @ 10"	45.50
	5	#4 @ 10"	47.46	#4 @ 10"	46.10	#4 @ 10"	45.21	#4 @ 10"	44.58	#4 @ 9"	45.06	#5 @ 10"	48.74	#5 @ 10"	48.44	#5 @ 10"	48.19	#5 @ 10"	47.99	#5 @ 10"	47.81	#5 @ 10"	47.67
	6	#4 @ 10"	49.52	#4 @ 10"	48.14	#4 @ 9"	48.23	#5 @ 10"	51.88	#5 @ 10"	51.38	#5 @ 9"	52.57	#5 @ 9"	52.27	#5 @ 8"	53.99	#5 @ 8"	53.79	#5 @ 7"	56.16	#5 @ 7"	56.01
	7	#4 @ 10"	51.73	#4 @ 10"	50.31	#4 @ 9"	50.43	#5 @ 10"	54.29	#5 @ 10"	53.78	#5 @ 9"	55.04	#5 @ 9"	54.73	#5 @ 8"	56.55	#5 @ 8"	56.35	#5 @ 7"	58.84	#5 @ 7"	58.70
	8	#4 @ 10"	54.00	#5 @ 10"	58.44	#5 @ 10"	57.45	#5 @ 8"	60.64	#5 @ 7"	62.92	#5 @ 6"	66.25	#5 @ 6"	65.94	#5 @ 6"	65.69	#6 @ 8"	67.76	#6 @ 8"	67.57	#6 @ 7"	71.45
	9	#4 @ 10"	56.20	#5 @ 10"	60.87	#5 @ 10"	59.85	#5 @ 8"	63.21	#5 @ 7"	65.60	#5 @ 6"	69.09	#5 @ 6"	68.78	#5 @ 6"	68.52	#6 @ 8"	70.69	#6 @ 8"	70.51	#6 @ 7"	74.57
10	2	#4 @ 10"	39.84	#4 @ 10"	38.53	#4 @ 10"	37.65	#4 @ 10"	37.03	#4 @ 10"	36.57	#4 @ 10"	36.20	#4 @ 10"	35.91	#4 @ 10"	35.67	#4 @ 10"	35.48	#4 @ 9"	36.07	#4 @ 9"	35.93
	3	#4 @ 10"	41.68	#4 @ 10"	40.35	#4 @ 10"	39.47	#4 @ 10"	38.84	#4 @ 10"	38.36	#4 @ 10"	38.00	#4 @ 10"	37.71	#4 @ 10"	37.46	#4 @ 10"	37.27	#4 @ 9"	37.91	#4 @ 9"	37.76
	4	#4 @ 10"	43.58	#4 @ 10"	42.22	#4 @ 10"	41.31	#4 @ 10"	40.67	#4 @ 10"	40.19	#4 @ 10"	39.82	#4 @ 10"	39.53	#4 @ 10"	39.28	#4 @ 10"	39.08	#4 @ 9"	39.77	#4 @ 9"	39.63
	5	#4 @ 10"	45.53	#4 @ 10"	44.14	#4 @ 10"	43.21	#4 @ 10"	42.56	#4 @ 10"	42.07	#5 @ 10"	46.44	#5 @ 10"	46.13	#5 @ 10"	45.87	#5 @ 10"	45.67	#5 @ 10"	45.49	#5 @ 10"	45.34
	6	#4 @ 10"	47.58	#4 @ 10"	46.14	#4 @ 10"	45.20	#4 @ 10"	44.53	#4 @ 10"	44.03	#5 @ 10"	48.67	#5 @ 10"	48.35	#5 @ 10"	48.08	#5 @ 10"	47.88	#5 @ 10"	47.69	#5 @ 10"	47.54
	7	#4 @ 10"	49.79	#4 @ 10"	48.31	#4 @ 10"	47.34	#5 @ 10"	51.97	#5 @ 10"	51.45	#5 @ 10"	51.04	#5 @ 9"	52.29	#5 @ 9"	52.03	#5 @ 8"	53.79	#5 @ 8"	53.61	#5 @ 7"	56.00
	8	#4 @ 10"	52.06	#4 @ 10"	50.54	#4 @ 10"	49.54	#5 @ 10"	54.43	#5 @ 10"	53.89	#5 @ 10"	53.47	#5 @ 9"	54.80	#5 @ 9"	54.53	#5 @ 8"	56.39	#5 @ 8"	56.20	#5 @ 7"	58.72
9	2	#4 @ 10"	38.01	#4 @ 10"	36.75	#4 @ 10"	35.85	#4 @ 10"	35.21	#4 @ 10"	34.73	#4 @ 10"	34.36	#4 @ 10"	34.06	#4 @ 10"	33.81	#4 @ 10"	33.61	#4 @ 10"	33.44	#4 @ 10"	33.30
	3	#4 @ 10"	39.93	#4 @ 10"	38.56	#4 @ 10"	37.64	#4 @ 10"	36.99	#4 @ 10"	36.51	#4 @ 10"	36.13	#4 @ 10"	35.83	#4 @ 10"	35.58	#4 @ 10"	35.38	#4 @ 10"	35.21	#4 @ 10"	35.06
	4	#4 @ 10"	41.81	#4 @ 10"	40.40	#4 @ 10"	39.47	#4 @ 10"	38.81	#4 @ 10"	38.31	#4 @ 10"	37.93	#4 @ 10"	37.63	#4 @ 10"	37.37	#4 @ 10"	37.17	#4 @ 10"	36.99	#4 @ 10"	36.84
	5	#4 @ 10"	43.75	#4 @ 10"	42.30	#4 @ 10"	41.35	#4 @ 10"	40.67	#4 @ 10"	40.17	#4 @ 10"	39.78	#4 @ 10"	39.47	#4 @ 10"	39.20	#4 @ 9"	39.86	#5 @ 10"	43.28	#5 @ 10"	43.12
	6	#4 @ 10"	45.79	#4 @ 10"	44.30	#4 @ 10"	43.31	#4 @ 10"	42.62	#4 @ 10"	42.10	#4 @ 10"	41.71	#4 @ 10"	41.39	#4 @ 10"	41.12	#4 @ 9"	41.82	#5 @ 10"	45.46	#5 @ 10"	45.30
	7	#4 @ 10"	48.04	#4 @ 10"	46.50	#4 @ 10"	45.49	#4 @ 10"	44.77	#5 @ 10"	49.29	#5 @ 10"	48.86	#5 @ 10"	48.53	#5 @ 10"	48.24	#5 @ 10"	48.03	#5 @ 10"	47.84	#5 @ 10"	47.67
	8	#4 @ 10"	50.43	#4 @ 10"	48.84	#4 @ 10"	47.80	#4 @ 10"	47.06	#5 @ 10"	51.83	#5 @ 10"	51.40	#5 @ 10"	51.05	#5 @ 10"	50.77	#5 @ 10"	50.54	#5 @ 10"	50.35	#5 @ 10"	50.18
8	2	#4 @ 10"	36.41	#4 @ 10"	35.01	#4 @ 10"	34.08	#4 @ 10"	33.42	#4 @ 10"	32.92	#4 @ 10"	32.54	#4 @ 10"	32.23	#4 @ 10"	31.97	#4 @ 10"	31.77	#4 @ 10"	31.59	#4 @ 10"	31.44
	3	#4 @ 10"	38.23	#4 @ 10"	36.80	#4 @ 10"	35.85	#4 @ 10"	35.18	#4 @ 10"	34.67	#4 @ 10"	34.28	#4 @ 10"	33.97	#4 @ 10"	33.70	#4 @ 10"	33.50	#4 @ 10"	33.32	#4 @ 10"	33.17
	4	#4 @ 10"	40.09	#4 @ 10"	38.61	#4 @ 10"	37.64	#4 @ 10"	36.95	#4 @ 10"	36.44	#4 @ 10"	36.04	#4 @ 10"	35.72	#4 @ 10"	35.45	#4 @ 10"	35.25	#4 @ 10"	35.07	#4 @ 10"	34.91
	5	#4 @ 10"	41.99	#4 @ 10"	40.47	#4 @ 10"	39.47	#4 @ 10"	38.76	#4 @ 10"	38.24	#4 @ 10"	37.83	#4 @ 10"	37.50	#4 @ 10"	37.23	#4 @ 10"	37.02	#4 @ 10"	36.84	#4 @ 10"	36.68
	6	#4 @ 10"	43.97	#4 @ 10"	42.40	#4 @ 10"	41.36	#4 @ 10"	40.64	#4 @ 10"	40.10	#4 @ 10"	39.68	#4 @ 10"	39.35	#4 @ 10"	39.07	#4 @ 9"	43.33	#5 @ 10"	43.13	#5 @ 10"	42.96
	7	#4 @ 10"	46.19	#4 @ 10"	44.56	#4 @ 10"	43.49	#4 @ 10"	42.74	#4 @ 10"	42.18	#4 @ 10"	41.75	#4 @ 10"	41.41	#4 @ 10"	41.13	#4 @ 9"	45.65	#5 @ 10"	45.45	#5 @ 10"	45.28
7	2	#4 @ 10"	34.90	#4 @ 10"	33.44	#4 @ 10"	32.47	#4 @ 10"	31.78	#4 @ 10"	31.27	#4 @ 10"	30.86	#4 @ 10"	30.54	#4 @ 10"	30.27	#4 @ 10"	30.06	#4 @ 10"	29.88	#4 @ 10"	29.72
	3	#4 @ 10"	36.73	#4 @ 10"	35.23	#4 @ 10"	34.23	#4 @ 10"	33.53	#4 @ 10"	33.00	#4 @ 10"	32.59	#4 @ 10"	32.26	#4 @ 10"	31.99	#4 @ 10"	31.78	#4 @ 10"	31.59	#4 @ 10"	31.43
	4	#4 @ 10"	38.59	#4 @ 10"	37.04	#4 @ 10"	36.01	#4 @ 10"	35.29	#4 @ 10"	34.75	#4 @ 10"	34.33	#4 @ 10"	33.99	#4 @ 10"	33.71	#4 @ 10"	33.50	#4 @ 10"	33.31	#4 @ 10"	33.14
	5	#4 @ 10"	40.48	#4 @ 10"	38.86	#4 @ 10"	37.80	#4 @ 10"	37.06	#4 @ 10"	36.50	#4 @ 10"	36.07	#4 @ 10"	35.73	#4 @ 10"	35.44	#4 @ 10"	35.22	#4 @ 10"	35.03	#4 @ 10"	34.86
	6	#4 @ 10"	42.39	#4 @ 10"	40.71	#4 @ 10"	39.61	#4 @ 10"	38.84	#4 @ 10"	38.26	#4 @ 10"	37.82	#4 @ 10"	37.47	#4 @ 10"	37.17	#4 @ 10"	36.95	#4 @ 10"	36.75	#4 @ 10"	36.58

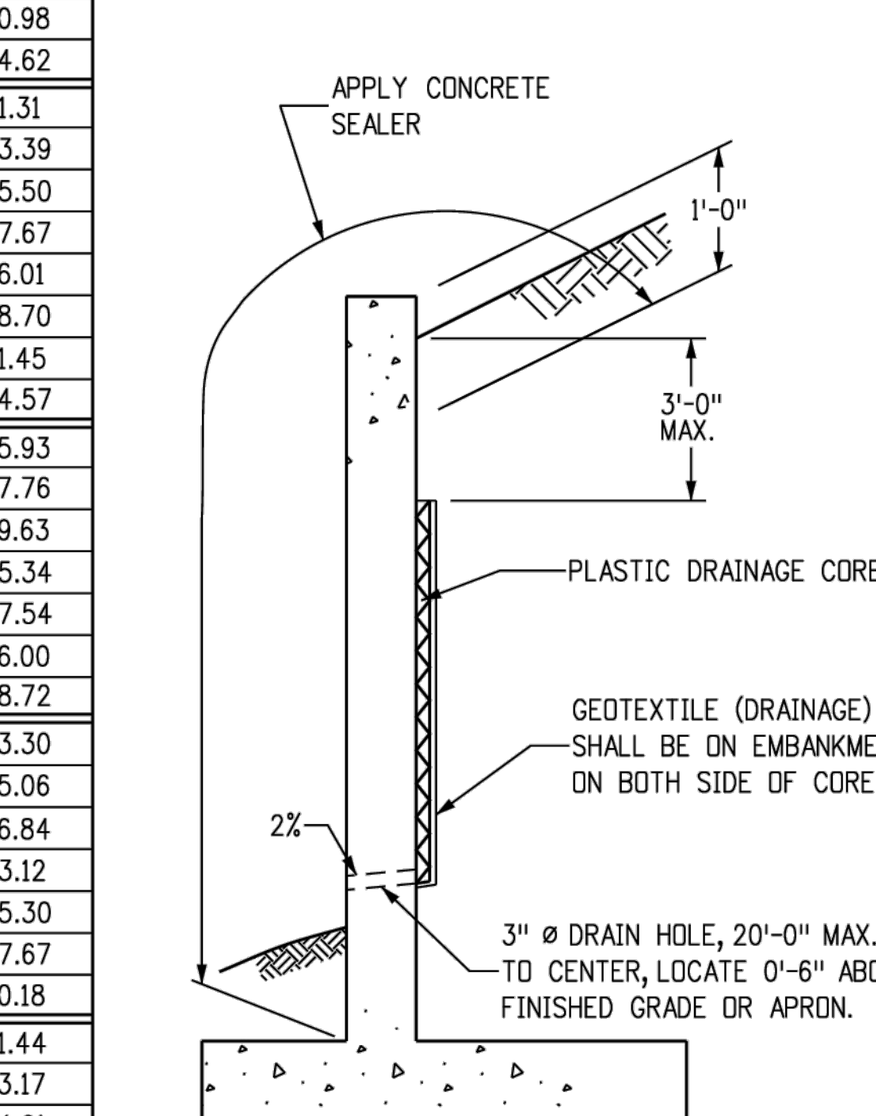
L (MULTIPLE OF m)

EXAMPLE:

SELECT THE c-BARS SIZE, SPACING AND STEEL QUANTITY FOR A 25.0 FEET LONG WINGWALL WITH m = 11.8 FT. AND k = 6.3 FT.

SOLUTION:

1. DETERMINE WINGWALL LENGTH IN MULTIPLE OF m:
   L / m = 25.0 / 11.8 = 2.12
   L = (2.12 x m), USE L ≤ (2.25 x m)
2. ROUND TO REAREST WHOLE NUMBER FOR m AND k:
   m = 11.8 FT., USE m = 12.0 FT.
   k = 6.3 FT., USE k = 6.0 FT.
3. DETERMINE c-BARS BY USING THE TABLE:
   L ≤ (2.25 x m)
   m = 12
   k = 6
   c-BARS: #6 @ 10"
   REINF. STEEL = 60.60 LB / LF
4. DETERMINE REINFORCING STEEL QUANTITY OF WHOLE WINGWALL:
   REINFORCING STEEL QUANTITY = 25.0 x 60.60 = 1,515 LB.



LIMITS OF CONCRETE SEALER AND WINGWALL DRAIN DETAILS

NOTES: 1. THE GEOCOMPOSITE SHALL BE SECURED TO THE WALL TO PREVENT MOVEMENT DURING BACKFILLING.
2. COST OF GEOCOMPOSITE DRAIN AND CONCRETE SEALER SHALL BE INCLUDED IN THE WORK.

Computer File Information		Sheet Revisions	
Creation Date: 07/04/12	Initials: HHB	Date:	Comments
Last Modification Date: 09/04/18	Initials:	09/04/18	LRFD Design
Full Path: www.codot.gov/business/designsupport			
Drawing File Name: 6010200202.dgn			
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English			

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Division of Project Support HHB

WINGWALLS FOR PIPE OR BOX CULVERTS
Issued By: Project Development Branch July 4, 2012
STANDARD PLAN NO. M-601-20
Sheet No. 2 of 2

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ENGINEERING RECORD DRAWINGS

03/16/2026

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

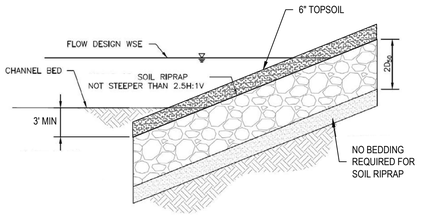
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BOX CULVERT DETAILS

ASB2514

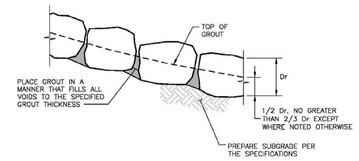
C4.07
Sheet 32 of 38

H:\C\Challenger Homes Inc\CO, El Paso County-CLH000014.20-Bent Grass\CADD\3 CD\El Paso County\CLH14.20_Box-Culvert_P&P.dwg - Sara Natelli - 3/11/2026



RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (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
*D_{50} = MEAN ROCK SIZE			

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)



BOULDER PLACEMENT NOTES:
1. PLACE BOULDERS WITH THE REQUIRED BOULDER HEIGHT VERTICAL. PLACE BOULDERS AS TIGHTLY TOGETHER AS POSSIBLE (WITHOUT TOUCHING) WHILE PROVIDING ENOUGH ROOM BETWEEN THEM TO THOROUGHLY VIBRATE THE GROUT AND TO ENSURE NO GAPS IN THE GROUT. THE SMALL DIMENSION OF A 2X4 CAN BE USED AS A GUIDE TO CHECK MINIMUM SPACING.
2. BEFORE GROUTING, CLEAN ALL DIRT AND MATERIAL FROM ROCK THAT COULD PREVENT THE GROUT FROM BINDING TO THE ROCK. KEEP BOULDERS FROM TOUCHING. AVOID SLIDING BOULDERS AGAINST SUBGRADE TO PROPERLY POSITION.

MATERIAL SPECIFICATIONS:
1. ALL GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH EQUAL TO 3200 PSI.
2. ONE CUBIC YARD OF GROUT SHALL HAVE A MINIMUM OF SIX (6) SACKS OF TYPE II PORTLAND CEMENT.
3. A MAXIMUM OF 25% TYPE F FLY ASH MAY BE SUBSTITUTED FOR THE PORTLAND CEMENT.
4. THE AGGREGATE SHALL BE COMPRISED OF 70% NATURAL SAND (FINES) AND 30% ⅜-INCH ROCK (COARSE).
5. THE GROUT SLUMP SHALL BE BETWEEN 4-INCHES TO 6-INCHES.
6. AIR ENTRAINMENT SHALL BE BETWEEN 5.5% AND 7.5%.
7. TO CONTROL SHRINKAGE AND CRACKING, 1.5 POUNDS OF FIBERMESH, OR EQUIVALENT, SHALL BE USED PER CUBIC YARD OF GROUT.
8. COLOR ADDITIVE IN REQUIRED AMOUNTS SHALL BE USED WHEN SO SPECIFIED BY CONTRACT.

GROUT PLACEMENT SPECIFICATIONS:
1. SPECIAL PROCEDURES SHALL BE REQUIRED FOR GROUT PLACEMENT WHEN THE AIR TEMPERATURES ARE LESS THAN 40°F OR GREATER THAN 90°F. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER OF THE PROCEDURES TO BE USED FOR PROTECTING THE GROUT.
2. GROUT SHALL BE DELIVERED BY MEANS OF A LOW PRESSURE (LESS THAN 10 PSI) GROUT PUMP USING A 2-INCH DIAMETER (MAXIMUM) NOZZLE.
3. FULL DEPTH PENETRATION OF THE GROUT INTO THE BOULDER VOIDS SHALL BE ACHIEVED BY INJECTING GROUT STARTING WITH THE NOZZLE NEAR THE BOTTOM AND RAISING IT AS THE GROUT FILLS, WHILE VIBRATING GROUT INTO PLACE USING A PENCIL VIBRATOR.
4. ALL GROUT BETWEEN BOULDERS SHALL BE TREATED WITH A BROOM FINISH.
5. AFTER GROUT PLACEMENT, EXPOSED BOULDER FACES SHALL BE CLEANED AND FREE OF GROUT.
6. ALL FINISHED GROUT SURFACES SHALL BE SPRAYED WITH A CLEAR LIQUID MEMBRANE CURING COMPOUND AS SPECIFIED IN ASTM C309.

Figure 9-15. Grouted boulder placement detail

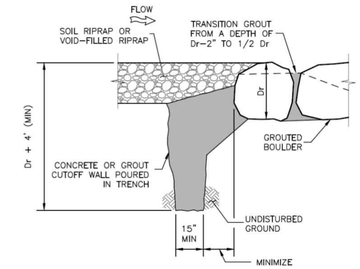


Figure 9-9. Concrete or grout cutoff wall upstream of drop structure

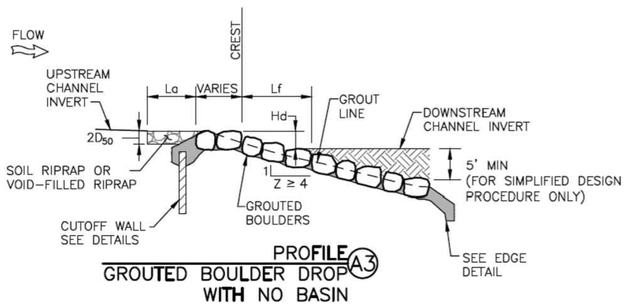


Figure 9-12. Cross sections of basic grouted stepped boulder drop structure

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FALCON, CO 80831 - EL PASO COUNTY

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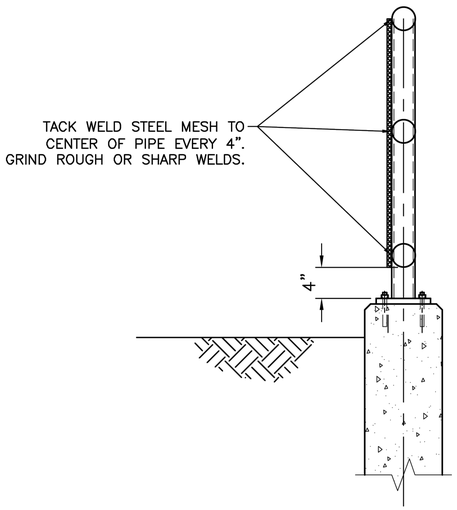
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Checked By:	RGD
Date:	3/13/26

BOX CULVERT DETAILS

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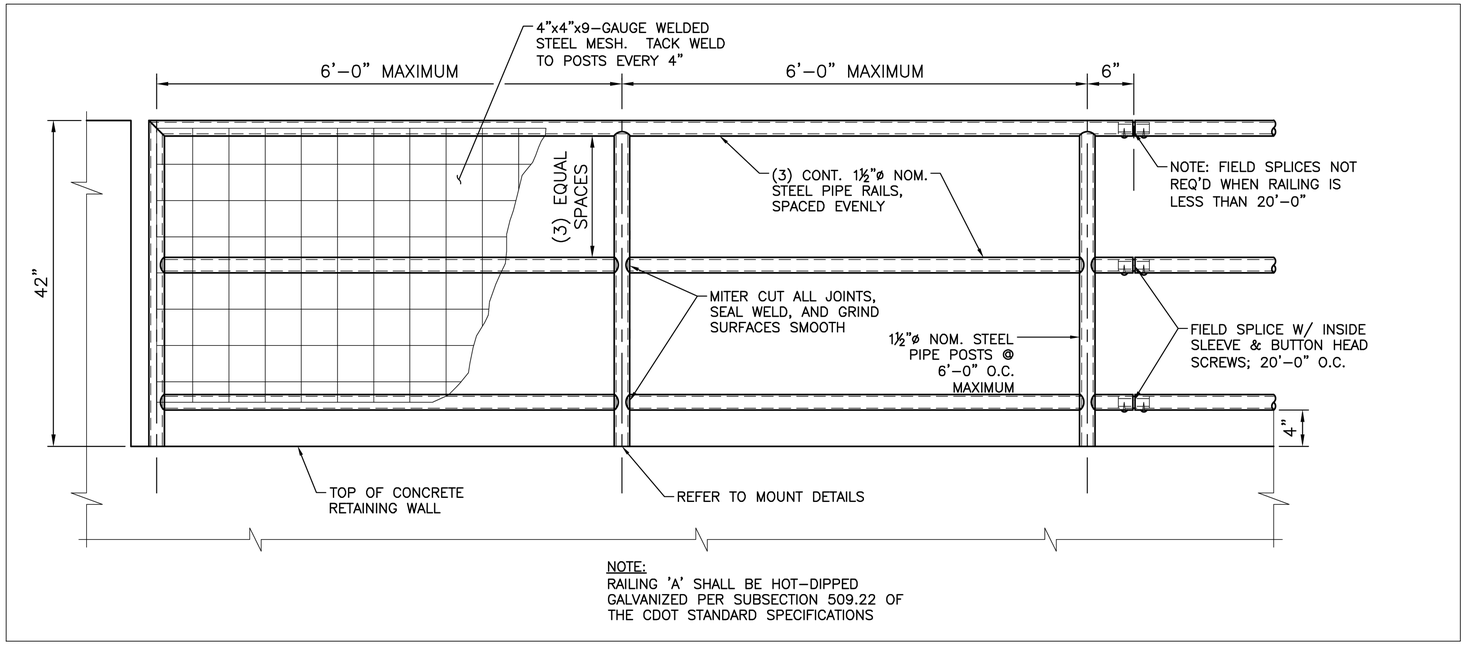
C4.08
Sheet 33 of 38

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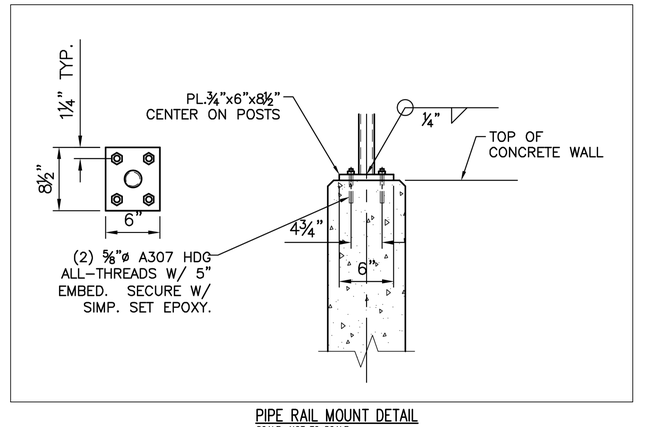
NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE CDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.
2. STEEL PIPE TO BE ASTM A53 GRADE B; WITH Fy = 35 KSI.
3. STEEL PLATES, CHANNELS & ANGLES TO BE ASTM A36; WITH Fy = 36 KSI.
4. ALL WELDING TO CONFORM TO CURRENT AWS D1.1 REQUIREMENTS.
5. COMPLETE ASSEMBLY OR SUB–ASSEMBLIES, BRACKETS, RAILING AND MISCELLANEOUS STEEL PIECES SHALL BE HOT–DIP GALVANIZED AFTER FABRICATION.
6. STRUCTURAL BOLTS, NUTS & WASHERS SHALL BE HOT–DIP GALVANIZED.
7. EXPANSION ANCHORS TO BE HILTI KWIK–BOLT II OR APPROVED EQUAL. INSTALL EXPANSION ANCHORS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
8. EXPANSION ANCHOR BOLTS, NUTS & WASHERS SHALL BE STAINLESS STEEL.
9. REFER TO OTHER DETAILS FOR CONCRETE REINFORCING REQUIREMENTS.
10. COORDINATE REBAR PLACEMENT IN CONCRETE TO MISS ANCHOR BOLTS & INSERTS.
11. GALVANIZED AREAS THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH A APPROVED COLD–GALVANIZING COMPOUND.
12. EPOXY SET ANCHORS SHALL UTILIZE HILTI HIT HY 150 CONSTRUCTION ADHESIVE AND HAS GALVANIZED OR STAINLESS STEEL THREADED RODS.
13. FIELD SPLICES SHALL BE MADE UTILIZING GALVANIZED STEEL PIPE SLEEVE INSERTS AND HOT–DIP GALVANIZED STEEL BOLTS, NUTS, AND WASHERS.
14. CROSS REFERENCE ASSOCIATED STANDARD DETAILS AS NECESSARY FOR STEEL FABRICATIONS.



NOTE:
RAILING 'A' SHALL BE HOT–DIPPED GALVANIZED PER SUBSECTION 509.22 OF THE CDOT STANDARD SPECIFICATIONS

PIPE RAILING DETAIL
SCALE: NOT TO SCALE



PIPE RAIL MOUNT DETAIL
SCALE: NOT TO SCALE

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FALCON, CO 80831 - EL PASO COUNTY

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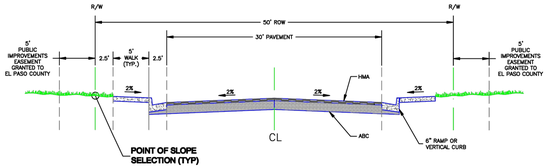
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

BOX CULVERT DETAILS

ASB2514

C4.09
Sheet 34 of 38

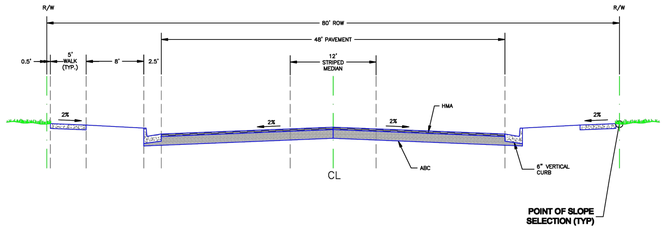
H:\Challenger Homes Inc\CO, El Paso County\CLH000014.20\Bent Grass\CAD\C4.09 Box Culvert_RSP.dwg, Box Notes, 3/11/2026



Roadway Design Parameters
Design Speed: 25 mph
Posted Speed: 25 mph
Maximum ADT: 3,000
Design Vehicle: WB-50

SCALE: NOT TO SCALE

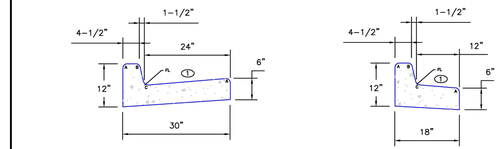
12/31/05	Urban Local Roadway	
DATE APPROVED:	Standard Cross Section	
John A. McCarty	REVISION DATE: 12/22/05	FILE NAME: SD_2-2
DEPARTMENT OF TRANSPORTATION		



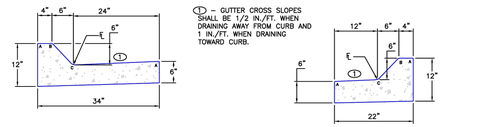
Roadway Design Parameters
Design Speed: 40 mph
Posted Speed: 35 mph
Maximum ADT: 20,000
Design Vehicle: WB-50

SCALE: NOT TO SCALE

12/31/05	Urban NonResidential Collector Roadway	
DATE APPROVED:	Standard Cross Section	
John A. McCarty	REVISION DATE: 12/22/05	FILE NAME: SD_2-3
DEPARTMENT OF TRANSPORTATION		

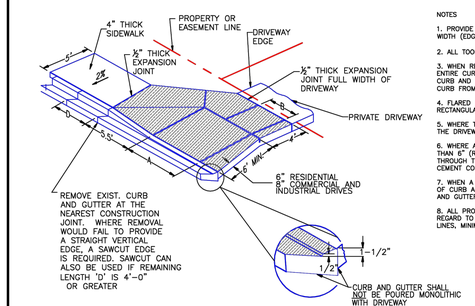


① – GUTTER CROSS SLOPES SHALL BE 1/2 IN./FT. WHEN DRAINING AWAY FROM CURB AND 1 IN./FT. WHEN DRAINING TOWARD CURB.



SCALE: NOT TO SCALE

8/11/11	Typical Curb and Gutter Details	
DATE APPROVED:	Standard Drawing	
André P. Brackin	REVISION DATE: 12/8/15	FILE NAME: SD_2-20
DEPARTMENT OF TRANSPORTATION		



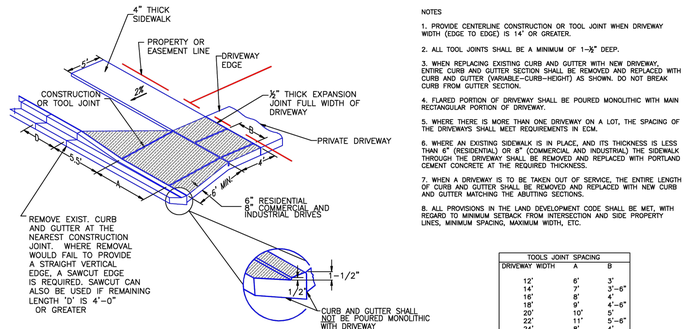
NOTES

1. PROVIDE CENTERLINE CONSTRUCTION OR TOOL JOINT WHEN DRIVEWAY WIDTH (EDGE TO EDGE) IS 14' OR GREATER.
2. ALL TOOL JOINTS SHALL BE A MINIMUM OF 1-½" DEEP.
3. WHEN REPLACING EXISTING CURB AND GUTTER WITH NEW DRIVEWAY, ENTIRE CURB AND GUTTER SECTION SHALL BE REMOVED AND REPLACED WITH CURB AND GUTTER (VARIABLE-CURB-HEIGHT) AS SHOWN. DO NOT BREAK CURB FROM GUTTER SECTION.
4. FLARED PORTION OF DRIVEWAY SHALL BE POURED MONOLITHIC WITH MAIN RECTANGULAR PORTION OF DRIVEWAY.
5. WHERE THERE IS MORE THAN ONE DRIVEWAY ON A LOT, THE SPACING OF THE DRIVEWAYS SHALL MEET REQUIREMENTS IN ECM.
6. WHERE AN EXISTING SIDEWALK IS IN PLACE, AND ITS THICKNESS IS LESS THAN 6" (RESIDENTIAL) OR 8" (COMMERCIAL AND INDUSTRIAL) THE SIDEWALK THROUGH THE DRIVEWAY SHALL BE REMOVED AND REPLACED WITH PORTLAND CEMENT CONCRETE AT THE REQUIRED THICKNESS.
7. WHEN A DRIVEWAY IS TO BE TAKEN OUT OF SERVICE, THE ENTIRE LENGTH OF CURB AND GUTTER SHALL BE REMOVED AND REPLACED WITH NEW CURB AND GUTTER MATCHING THE ABUTTING SECTIONS.
8. ALL PROVISIONS IN THE LAND DEVELOPMENT CODE SHALL BE MET, WITH REGARD TO MINIMUM SETBACK FROM INTERSECTION AND SIDE PROPERTY LINES, MINIMUM SPACING, MAXIMUM WIDTH, ETC.

TOOLS JOINT SPACING		
DRIVEWAY WIDTH	A	B
12'	6'	3'
14'	7'	3'-6"
16'	8'	4'
18'	9'	4'-6"
20'	10'	5'
22'	11'	5'-6"
24'	8'	4'
26'	8'-8"	4'-4"
28'	9'-4"	4'-8"
30'	10'	5'

SCALE: NOT TO SCALE

8/11/11	Driveway Detail With Attached Sidewalk	
DATE APPROVED:	Standard Drawing	
André P. Brackin	REVISION DATE: 11/10/04	FILE NAME: SD_2-24
DEPARTMENT OF TRANSPORTATION		



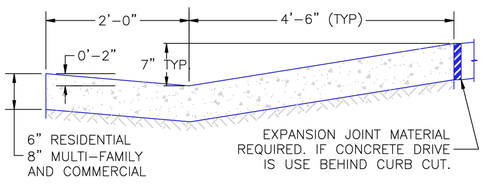
NOTES

1. PROVIDE CENTERLINE CONSTRUCTION OR TOOL JOINT WHEN DRIVEWAY WIDTH (EDGE TO EDGE) IS 14' OR GREATER.
2. ALL TOOL JOINTS SHALL BE A MINIMUM OF 1-½" DEEP.
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6. WHERE AN EXISTING SIDEWALK IS IN PLACE, AND ITS THICKNESS IS LESS THAN 6" (RESIDENTIAL) OR 8" (COMMERCIAL AND INDUSTRIAL) THE SIDEWALK THROUGH THE DRIVEWAY SHALL BE REMOVED AND REPLACED WITH PORTLAND CEMENT CONCRETE AT THE REQUIRED THICKNESS.
7. WHEN A DRIVEWAY IS TO BE TAKEN OUT OF SERVICE, THE ENTIRE LENGTH OF CURB AND GUTTER SHALL BE REMOVED AND REPLACED WITH NEW CURB AND GUTTER MATCHING THE ABUTTING SECTIONS.
8. ALL PROVISIONS IN THE LAND DEVELOPMENT CODE SHALL BE MET, WITH REGARD TO MINIMUM SETBACK FROM INTERSECTION AND SIDE PROPERTY LINES, MINIMUM SPACING, MAXIMUM WIDTH, ETC.

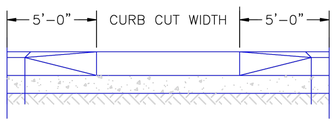
TOOLS JOINT SPACING		
DRIVEWAY WIDTH	A	B
12'	6'	3'
14'	7'	3'-6"
16'	8'	4'
18'	9'	4'-6"
20'	10'	5'
22'	11'	5'-6"
24'	8'	4'
26'	8'-8"	4'-4"
28'	9'-4"	4'-8"
30'	10'	5'

SCALE: NOT TO SCALE

8/11/11	Driveway Detail With Detached Sidewalk	
DATE APPROVED:	Standard Drawing	
André P. Brackin	REVISION DATE: 11/10/04	FILE NAME: SD_2-25
DEPARTMENT OF TRANSPORTATION		



CROSS SECTION



FRONT VIEW

SCALE: NOT TO SCALE

8/11/11	Driveway Cut Detail	
DATE APPROVED:	Standard Drawing	
André P. Brackin	REVISION DATE: 11/10/04	FILE NAME: SD_2-23
DEPARTMENT OF TRANSPORTATION		

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FOR
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BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
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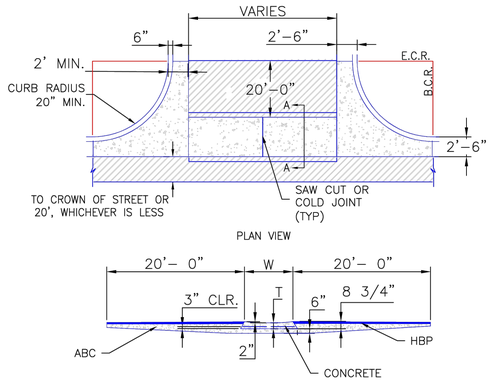
Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

SITE DETAILS

ASB2514

C5.01
Sheet 35 of 38

H:\Challenger Homes Inc\CO. El Paso County\CLH000014 Bluffers Forest\ACAD\13 C5\01 Final Civil\CLH14_05_CO Curve Sheet.dwg, Sara Mellott - 3/13/2026



PLAN VIEW

SECTION A–A

NOTES

1. W – WIDTH SHALL BE 6' FOR LOCAL, 8' FOR COLLECTORS, AND 10' FOR ARTERIAL ROADS.

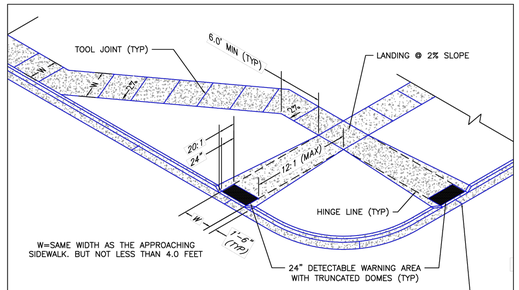
2. T – SQUARED–OFF RETURN TO BE POURED MONOLITHICALLY, 8" PCC FOR LOCAL ROADS, 9" FOR COLLECTORS WITH 6x6 – 4.4 W.W.F. OR #4 REINFORCING BAR @ 18" EACH WAY.

3. = 3" MINIMUM ASPHALT DEPTH (2 LIFTS).

4. DESIGN TO SPECIFY ELEVATIONS AT PI AND PCR.

SCALE: NOT TO SCALE

DATE APPROVED: 8/11/11 André P. Brackin DEPARTMENT OF TRANSPORTATION	Typical Cross Pan Layout Detail Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 12/8/15	FILE NAME: SD_2–26



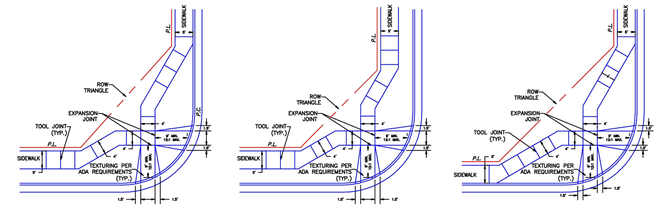
PEDESTRIAN RAMP NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT ENGINEERING CRITERIA MANUAL AND ADA REQUIREMENTS.
2. CONTRACTOR TO NOTIFY ENGINEERING DIVISION INSPECTION STAFF 48 HOURS PRIOR TO CONCRETE PLACEMENT.
3. PEDESTRIAN RAMP CONSTRUCTION SHALL BE A MINIMUM 4,500 PSI CONCRETE, MINIMUM 4" THICK, NON–COLORED, NON–SCORED, COARSE BROOM FINISH.
4. RAMP LOCATION AND LENGTH MAY REQUIRE MODIFICATION TO MAINTAIN THE 12:1 MAXIMUM RUNNING RAMP SLOPE AND 20:1 DETECTABLE WARNING AREA DUE TO STREET INTERSECTION GRADES AND/OR ALIGNMENTS.
5. DETECTABLE WARNING AREA SHALL START A MINIMUM OF 6" BUT NOT MORE THAN 8" FROM THE FLOWLINE OF THE CURB AT ANY POINT.
6. DETECTABLE WARNING AREA SHALL BE PREFABRICATED, REDDISH INTEGRALLY COLORED, TRUNCATED–DOME, PAVERS. THERMOPLASTIC TRUNCATED DOMES WILL NOT BE ACCEPTED.
7. THE DETECTABLE WARNING AREA SHALL BE 24" IN LENGTH AND THE FULL WIDTH OF THE RAMP.
8. RAMP WIDTH REQUIRED IS SAME AS APPROACHING SIDEWALK; 4' MINIMUM.
9. ALL RAMPS WILL BE PERPENDICULAR TO TRAFFIC WITH THE EXCEPTION OF MID–BLOCK OR TERMINAL RAMPS WHICH MAY BE PARALLEL SUBJECT TO APPROVAL.
10. AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL/SIGNAGE, UTILITIES/JUNCTION BOXES, OR OTHER OBSTRUCTIONS WITHIN PROPOSED RAMP AREAS.

GENERAL NOTES

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

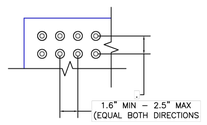
DATE APPROVED: 7/9/09 André P. Brackin DEPARTMENT OF TRANSPORTATION	Pedestrian Intersection Ramp Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 12/8/15	FILE NAME: SD_2–41



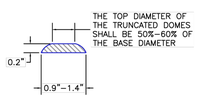
SCALE: NOT TO SCALE

DATE APPROVED: 9/16/10 André P. Brackin DEPARTMENT OF TRANSPORTATION	Pedestrian Intersection Ramp Detail Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 11/10/04	FILE NAME: SD_2–40

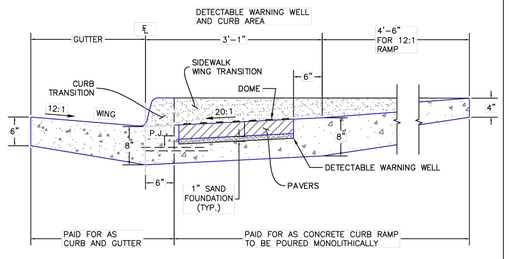
TRUNCATED DOME DETAILS



DOME SPACING



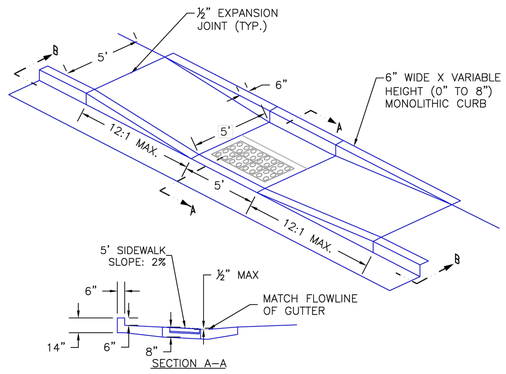
ELEVATION VIEW



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

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

DATE APPROVED: 1/1/08 John A. McCarty DEPARTMENT OF TRANSPORTATION	Truncated Dome Details Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 11/25/15	FILE NAME: SD_2–42



SCALE: NOT TO SCALE

DATE APPROVED: 8/11/11 André P. Brackin DEPARTMENT OF TRANSPORTATION	Parallel Pedestrian Ramp Detail Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 12/8/15	FILE NAME: SD_2–50

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

SITE DETAILS

ASB2514

C5.02

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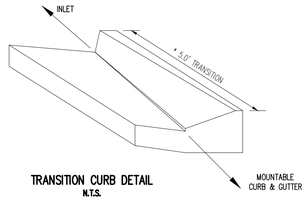
M:\CH\Challenger Homes Inc\CO, El Paso County\CLH000014_Bent Grass\Civil\CAD\C3 LDM\1 Plan Sheets\SD\CLH14_SD_C3 Cover Sheet.dwg - Ezra Nichols - 3/13/2026

NOTE:

1. ALL INTERNAL SIGNS SHALL BE 4" FONT LETTER SIZE

NOTE TO CONTRACTOR:

1. SIGNS AND POLES SHALL BE PER CDOT STANDARDS S-614-2, S-614-3 AND S-614-8, LATEST REVISION.
2. ALL SIGNAGE INSTALLATION IS TO BE IN COMPLIANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.



TRANSITION CURB DETAIL
N.T.S.

NOTE:

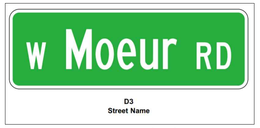
*WHEN A TYPE R INLET IS USED WITH MOUNTABLE CURB AND GUTTER, 5.0' TRANSITION SHALL BE REQUIRED. TRANSITION SHALL BE PAID FOR AS CURB AND GUTTER.



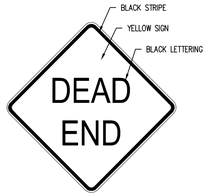
SPEED LIMIT SIGN (R2-1)
NOT TO SCALE



STOP SIGN (R1-1)
NOT TO SCALE



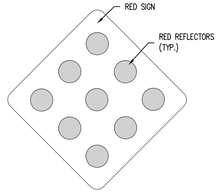
STREET NAME (D-3)
NOT TO SCALE



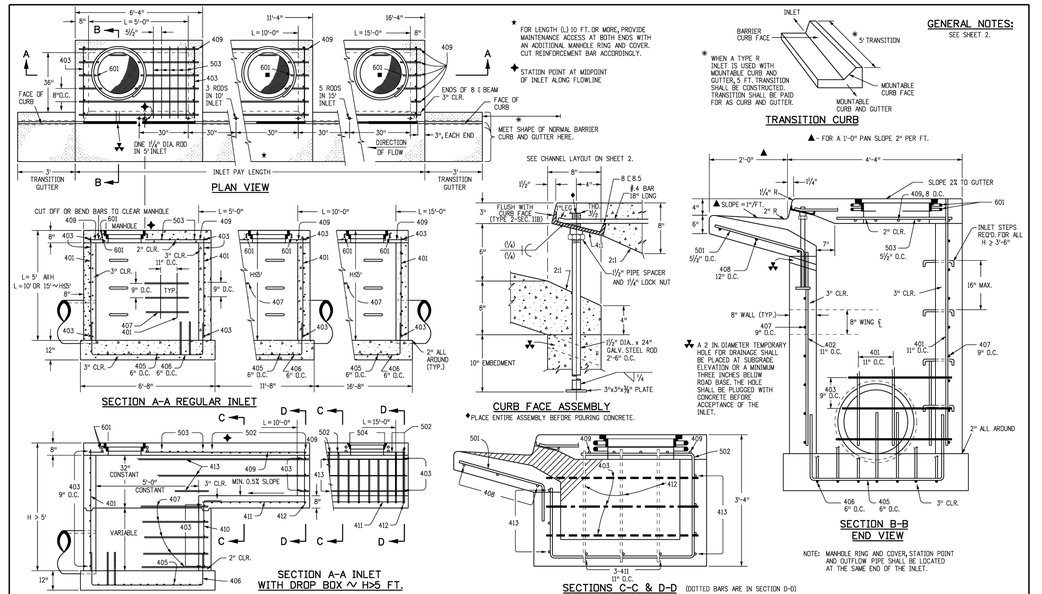
DEAD END SIGN (W14-1)
NOT TO SCALE



NO OUTLET SIGN (W14-2)
NOT TO SCALE



TYPE 4 OBJECT MARKER
NOT TO SCALE



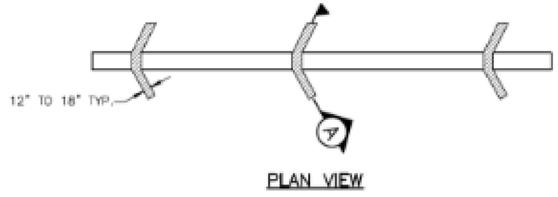
Computer File Information		Sheet Revisions			
Creation Date: 07/04/12 Initials: DD		Date:	Comments		
Last Modification Date: 07/04/12 Initials: LTA	(R-X)				
Full Path: www.coloradodot.info/business/designsupport	(R-X)				
Drawing File Name: 6040120102.dgn	(R-X)				
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)				

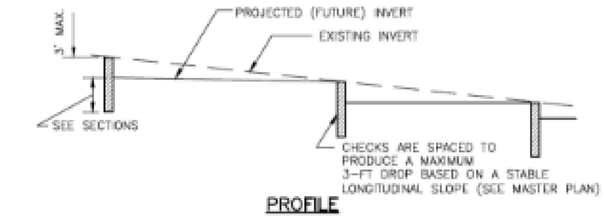
Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, Colorado 80222
Phone: (303) 757-9083
Fax: (303) 757-9820
Project Development Branch DD/LTA

CURB INLET TYPE R

Issued By: Project Development Branch July 4, 2012

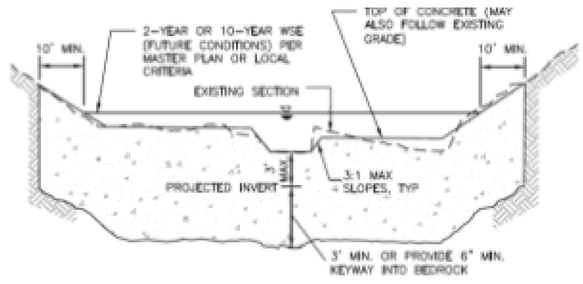
STANDARD PLAN NO.
M-604-12
Sheet No. 1 of 2





NOTES:
1. SHEET PILE IS PREFERRED AND MUST BE USED WHERE SOIL CANNOT HOLD A VERTICAL WALL.

Figure 9-26. Check structure details (Part 1 of 3)



NOTES:
1. TRENCH IN UNDISTURBED SOIL. FORM TOP 6" OF CHECK. DO NOT OVER EXCAVATE TO FORM WALLS OR CONSTRUCT A FOOTING.
2. THE STRUCTURE MAY BE COVERED WITH 6" OF SOIL OUTSIDE OF THE LOW FLOW AREA.
3. VIBRATE CONCRETE INTO TRENCH.

SECTION
CONCRETE CHECK A2

Figure 9-27. Check structure details (Part 2 of 3)

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

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FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

SITE DETAILS

ASB2514

C5.03
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M:\Challenger Homes\HCCD, El Paso County\CLH000014.20\Bent Grass\CAD\C5.03 El Paso County\Civil\14.20_C5.03 Curb Inlet Type R.dwg, Tom Nesbitt, 3/11/2026

MARK	BAR # OR SIZE	D.C. SPACING	TYPE	ALL INLETS		INLETS: H ≤ 5 FT.				INLETS: H > 5 FT.			
				L = 5 FT.		L = 10 FT.		L = 15 FT.		L = 10 FT.		L = 15 FT.	
				NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH
401	4	11"	II	15	*	21	*	26	*	11	*	11	*
402	4	11"	II	7	*	13	*	18	*	7	*	7	*
403	4	9"	II	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"
405	4	6"	VI	11	6'-10"	21	6'-10"	31	6'-10"	11	6'-10"	11	6'-10"
406	4	6"	VIII	7	8'-10"	7	13'-10"	7	18'-10"	7	8'-10"	7	8'-10"
407	4	9"	II	*	5'-10"	*	10'-10"	*	15'-10"	*	5'-10"	*	5'-10"
408	4	12"	II	3	6'-10"	3	11'-10"	3	16'-0"	3	11'-10"	3	16'-0"
409	4	8"	II	6	5'-10"	6	10'-10"	6	15'-10"	6	10'-10"	6	15'-10"
410	4	11"	VII							3	*	3	*
411	4	11"	II							3	5'-2"	3	10'-2"
412	4	11"	II							3	2'-9"	3	7'-9"
413	4	9"	II							7	10'-10"	7	15'-10"
501	5	5½"	IV	11	3'-4"	22	3'-4"	33	3'-4"	22	3'-4"	33	3'-4"
502	5	5½"	III							11	11'-5"	17	11'-5"
503	5	5½"	II	5	3'-6"	16	3'-6"	27	3'-6"	6	3'-6"	6	3'-6"
504	5	5½"	IX									5	8'-4"
601	6	2½"	V	2	8'-10"	2	8'-10"	2	8'-10"	2	8'-10"	4	8'-10"
■BCB.5				1	5'-10"	1	10'-10"	1	15'-10"	1	10'-10"	1	15'-10"
				2 BARS, 1 RODS		4 BARS, 3 RODS		8 BARS, 5 RODS		4 BARS, 3 RODS		8 BARS, 5 RODS	
				REGULAR INLETS						DROP BOX INLETS			

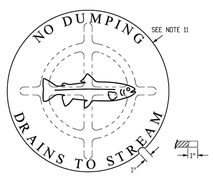
* VARIABLE REFER TO TABLE TWO.
■ INCLUDE #4, 18 IN. BARS (SEE CHANNEL LAYOUT).

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

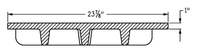
"H"	LENGTH			NO. REQ'D. REGULAR		NO. REQ'D. DROP BOX		L = 5 FT.		L = 10 FT.		L = 15 FT.	
	401	402	410	403	407	403	407	CONC. CU. YDS.	STEEL LBS.	CONC. CU. YDS.	STEEL LBS.	CONC. CU. YDS.	STEEL LBS.
3'-0"	2'-8"	1'-8"		10	7			3.2	285	5.3	497	7.4	706
3'-6"	3'-2"	2'-2"		10	7			3.4	305	5.7	528	7.9	747
4'-0"	3'-8"	2'-8"		12	9			3.7	326	6.0	559	8.4	786
4'-6"	4'-2"	3'-2"		12	9			3.9	334	6.4	571	8.8	803
5'-0"	4'-8"	3'-8"		14	11			4.1	354	6.7	602	9.3	844
5'-6"	5'-2"	4'-2"	3'-5"	16	13	15	6	4.4	375	6.0	607	7.4	850
6'-0"	5'-8"	4'-8"	3'-11"	16	13	16	6	4.6	382	6.2	616	7.6	860
6'-6"	6'-2"	5'-2"	4'-5"	18	15	18	8	4.8	402	6.4	637	7.8	880
7'-0"	6'-8"	5'-8"	4'-11"	20	17	19	10	5.0	423	6.6	654	8.0	897
7'-6"	7'-2"	6'-2"	5'-5"	20	17	20	10	5.3	430	6.9	664	8.3	907
8'-0"	7'-8"	6'-8"	5'-11"	22	19	22	12	5.5	451	7.1	684	8.5	927
8'-6"	8'-2"	7'-2"	6'-5"	24	21	23	14	5.7	471	7.3	702	8.7	944
9'-0"	8'-8"	7'-8"	6'-11"	24	21	24	14	6.0	479	7.6	711	9.0	954
9'-6"	9'-2"	8'-2"	7'-5"	26	23	26	16	6.2	499	7.8	732	9.2	974
10'-0"	9'-8"	8'-8"	7'-11"	28	25	27	18	6.4	520	8.0	749	9.4	992
10'-6"	10'-2"	9'-2"	8'-5"	28	25	28	18	6.7	527	8.3	759	9.7	1001
11'-0"	10'-8"	9'-8"	8'-11"	30	27	30	20	6.9	547	8.5	779	9.9	1022

NOTES: FOR L = 5 FT., L = 10 FT., AND L = 15 FT.
REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE THE HEAVY BLACK LINE.
DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE THE HEAVY BLACK LINE.
STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL CHANNEL.

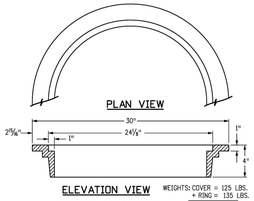
TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"



PLAN VIEW



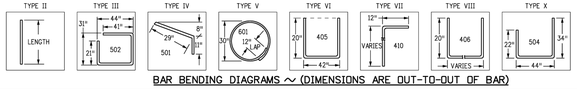
ELEVATION VIEW
MANHOLE COVER (TYP.)



PLAN VIEW

ELEVATION VIEW
MANHOLE RING (TYP.)

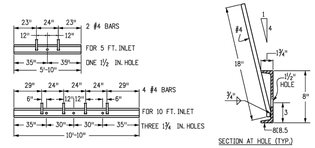
WEIGHTS: COVER = 125 LBS.
= RING = 135 LBS.
TOTAL = 260 LBS.



BAR BENDING DIAGRAMS ~ (DIMENSIONS ARE OUT-TO-OUT OF BAR)

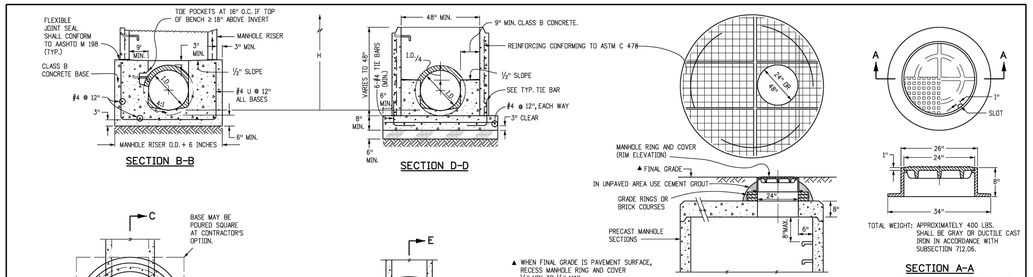
GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. CONCRETE WALLS SHALL BE FORMED ON BOTH SIDES AND SHALL BE 8 IN. THICK.
3. INLET STEPS SHALL BE IN CONFORMANCE WITH AASHTO M 199.
4. CURB FACE ASSEMBLY SHALL BE GALVANIZED AFTER WELDING.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN. CURB AND GUTTER CORNERS SHALL BE FINISHED TO MATCH THE EXISTING CURB AND GUTTER BEYOND THE TRANSITION GUTTER.
6. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. ALL REINFORCING BARS SHALL BE EPOXY COATED.
7. DIMENSIONS AND WEIGHTS OF TYPICAL MANHOLE RING AND COVER ARE NOMINAL.
8. MATERIAL FOR MANHOLE RINGS AND COVERS SHALL BE GRAY OR DUCTILE CAST IRON IN ACCORDANCE WITH SUBSECTION 712.06.
9. SINCE PIPE ENTRIES INTO THE INLET ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK. QUANTITIES INCLUDE VOLUMES OCCUPIED BY PIPES.
10. STRUCTURAL STEEL SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
11. ALL MANHOLE COVERS SHALL BE CAST WITH A "NO DUMPING DRAINS TO STREAM" MESSAGE AND A FISH SYMBOL. THE SURFACE OF THE MANHOLE COVER SHALL HAVE A NON-SLIP PATTERN.



CHANNEL LAYOUT DETAILS
SEE CURB FACE ASSEMBLY ON SHEET 1.

SECTION AT HOLE (TYP.)

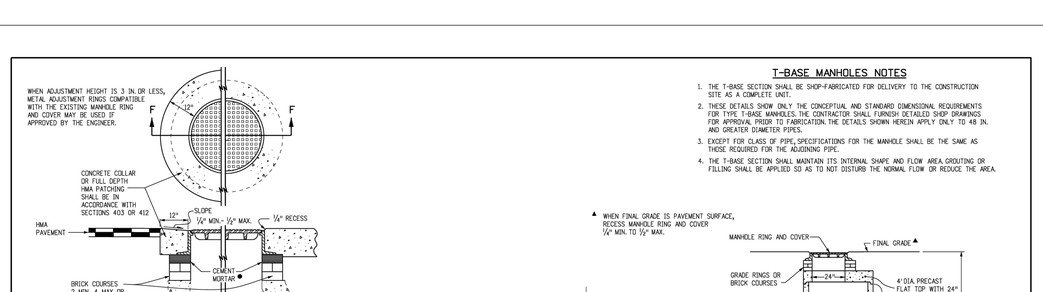


LEGEND

- SUITABLE SUBGRADE
- GRANULAR BEDDING MATERIAL
- CONCRETE

PRECAST MANHOLE BASES NOTES:

1. THE BASE SLAB SHALL BE POURED MONOLITHICALLY WITH BOTTOM RISER SECTION.
2. PRECAST MANHOLE BASES SHALL FIT THE CONDITIONS AND LOCATIONS FOR WHICH THEY ARE INTENDED WITHOUT ANY FIELD MODIFICATIONS. ANY MANHOLE BASE WHICH REQUIRES FIELD CUTTING OR MODIFICATION IN ORDER TO FIT THE LOCATIONS INTENDED WILL BE REJECTED BY THE ENGINEER AND REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT.
3. PRECAST MANHOLE BASES SHALL BE BEDDED ON AN APPROVED GRANULAR BEDDING MATERIAL AS SHOWN ABOVE.



MAHHOLE BOX BASE

MARK	SIZE	TYPE	WT. #/FT.	BARS	I.D. 54"	60"	66"	72"	84"	96"	FORMULAS
401	4	I	0.668	(NO. REQ'D. / LENGTH / WEIGHT *)	18 / 8'-1" / 97.2	18 / 8'-8" / 104.2	18 / 9'-3" / 111.2	18 / 9'-10" / 118.2	18 / 11'-0" / 132.3	18 / 12'-2" / 146.3	401 BAR LENGTH = 32" + 2W + I.D.
402	4	III	0.668	(NO. REQ'D. / LENGTH / WEIGHT *)	5 / 5'-0" / 18.1	5 / 6'-0" / 20.0	5 / 6'-7" / 22.0	5 / 7'-2" / 23.9	5 / 8'-4" / 27.8	5 / 9'-6" / 31.7	402 BAR LENGTH = I.D. + 2W
501	5	I	1.043	(NO. REQ'D. / LENGTH / WEIGHT *)	17 / 7'-5" / 131.5	17 / 8'-0" / 141.8	17 / 8'-7" / 152.2	17 / 9'-2" / 162.5	17 / 10'-4" / 183.2	17 / 11'-6" / 203.9	501 BAR LENGTH = 24" + I.D. + 2W
502	5	I	1.043	(NO. REQ'D. / LENGTH / WEIGHT *)	22 / 5'-0" / 114.7	23 / 5'-0" / 119.9	25 / 5'-0" / 130.4	26 / 5'-0" / 135.6	29 / 5'-0" / 151.2	32 / 5'-0" / 166.9	502 NUMBER BARS REQ'D. = 3 + ((24+I.D.+2W)/6 @ 5") +1
503	5	II	1.043	(NO. REQ'D. / LENGTH / WEIGHT *)	16 / 12'-10" / 214.2	16 / 13'-5" / 223.9	17 / 14'-0" / 292.8	18 / 14'-7" / 273.8	20 / 15'-9" / 328.5	24 / 16'-11" / 423.5	503 NUMBER BARS REQ'D. = 2((3+I.D.+2W)/12 @ 12") BAR LENGTH = 4'-9"+2(16+W+I.D./2)
504	5	I	1.043	(NO. REQ'D. / LENGTH / WEIGHT *)	12 / 8'-1" / 101.2	14 / 8'-8" / 126.6	14 / 9'-3" / 135.1	16 / 9'-10" / 164.1	18 / 11'-0" / 206.5	20 / 12'-2" / 253.8	504 NUMBER BARS REQ'D. = 2((W+I.D.-4)/12 @ 12") +1 BAR LENGTH = 32"+2W+I.D.
1101	11	I	5.313	(NO. REQ'D. / LENGTH / WEIGHT *)	4 / 7'-2" / 152.3	4 / 7'-9" / 164.7	4 / 8'-4" / 177.1	4 / 8'-11" / 189.5	4 / 10'-1" / 214.3	4 / 11'-3" / 239.1	1101 BAR LENGTH = 21" + I.D. + 2W
1102	11	I	5.313	(NO. REQ'D. / LENGTH / WEIGHT *)	4 / 2'-8" / 56.7	4 / 2'-8" / 56.7	4 / 2'-8" / 56.7	4 / 2'-8" / 56.7	4 / 2'-8" / 56.7	4 / 2'-8" / 56.7	BENDING TYPE I: STRAIGHT
1103	11	I	5.313	(NO. REQ'D. / LENGTH / WEIGHT *)	3 / 5'-0" / 79.7	3 / 5'-0" / 79.7	3 / 5'-0" / 79.7	3 / 5'-0" / 79.7	3 / 5'-0" / 79.7	3 / 5'-0" / 79.7	TYPE II: 4'-0", 16"+W+I.D./2 TYPE III: 12", 12", I.D.+2W-38"
* REINFORCING STEEL TOTAL					965.6	1,037.5	1,127.2	1,204.0	1,380.2	1,601.6	
CONCRETE - CUBIC YARDS - TOTAL					6.0	6.6	7.3	8.0	9.5	11.1	

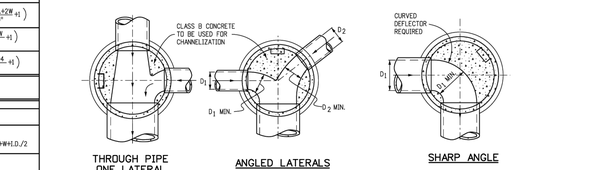
NOTE: QUANTITIES ARE BASED ON SAME SIZE PIPE ENTRANCE TO AND EXIT FROM, BASE AND A 4 FT. MANHOLE ENTRANCE INTO TOP SLAB OF BASE.

QUANTITIES FOR CONCRETE MANHOLE BOX BASE

GENERAL NOTES

1. SINCE ALL PIPE ENTRIES INTO THE BASE ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK.
2. THE PRECAST FLAT TOP MAY BE USED ON ANY MANHOLE. THE ECCENTRIC CONE MAY BE USED WHEN THE MANHOLE "H" HEIGHT IS AT LEAST 8 FT.
3. THE MANHOLE RING FRAME SHALL BE SET IN A BED OF GROUT. THE FRAME SHALL BE SURROUNDED WITH A CEMENT GROUT IN UNPAVED AREA, OR A CONCRETE COLLAR IN PAVED AREA. SEE DETAILS ON SHEETS 2 AND 3.
4. DESIGN OF BOX BASE IS BASED ON STRAIGHT RUNS OF PIPE OR CHANGE IN DIRECTION OF LESS THAN 45°. SPECIAL DESIGN IS REQUIRED FOR 45° OR GREATER.
5. PRECAST MANHOLES AND REINFORCEMENT SHALL CONFORM TO AASHTO M 199 (ASTM C 478).
6. CAST-IN-PLACE MANHOLES SHALL BE CLASS B CONCRETE.
7. STEPS SHALL BE REQUIRED WHEN THE MANHOLE DEPTH EXCEEDS 3 FT.-6 IN. AND SHALL CONFORM TO AASHTO M 199.
8. ALL REINFORCING STEEL SHALL BE GRADE 60 AND EPOXY COATED. VERTICAL STEEL SHALL BE PLACED AT CENTERLINE OF WALL. ALL BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.
9. ALL PIPE ENTRIES INTO THE BASE OF MANHOLE SHALL BE CONNECTED BY OPEN CHANNELIZATION ADJUSTED FOR PIPE SIZE, SHAPE, SLOPE, AND DIRECTION OF FLOW. DETAILS SHOWN ARE TYPICAL FOR INSTALLATIONS WITH ALL INVERTS OF SAME RELATIVE ELEVATION. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, SPECIAL BASE/CHANNEL DETAILS WILL BE SHOWN ON THE PLANS.
10. FLOW CHANNELS AND INVERTS SHALL BE FORMED BY SHAPING WITH CLASS B CONCRETE OR APPROVED GROUT.
11. STUB-OUTS SHALL EXTEND 2 FT. MINIMUM BEYOND OUTSIDE WALL SURFACE OF MANHOLE AND BE SATISFACTORILY PLUGGED.
12. THE SLOPE OF THE MANHOLE COVER SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.

▲ WHEN FINAL GRADE IS PAVEMENT SURFACE, RECESS MANHOLE RING AND COVER ¼" MIN. TO ½" MAX.



TYPICAL CHANNELIZATION DETAILS

MANHOLE T-BASE

T-BASE MANHOLES NOTES

1. THE T-BASE SECTION SHALL BE SHOP-FABRICATED FOR DELIVERY TO THE CONSTRUCTION SITE AS A COMPLETE UNIT.
2. THESE DETAILS SHOW ONLY THE CONCEPTUAL AND STANDARD DIMENSIONAL REQUIREMENTS FOR TYPE T-BASE MANHOLES. THE CONTRACTOR SHALL FURNISH DETAILED SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION. THE DETAILS SHOWN HEREIN APPLY ONLY TO 48 IN. AND GREATER DIAMETER PIPES.
3. EXCEPT FOR CLASS OF PIPE, SPECIFICATIONS FOR THE MANHOLE SHALL BE THE SAME AS THOSE REQUIRED FOR THE ADJOINING PIPE.
4. THE T-BASE SECTION SHALL MAINTAIN ITS INTERNAL SHAPE AND FLOW AREA. GROUTING OR FILLING SHALL BE APPLIED SO AS TO NOT DISTURB THE NORMAL FLOW OR REDUCE THE AREA.

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ENGINEERING RECORD DRAWINGS

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CHALLENGER HOMES

CONSTRUCTION DOCUMENTS
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 - EL PASO COUNTY

#	Date	Issue / Description	Init.

Project No:	CLH000014.20
Drawn By:	JDP
Checked By:	RGD
Date:	3/13/26

SITE DETAILS

ASB2514

C5.04
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H:\Challenger Homes Inc\CO. El Paso County\CLH000014.20 Bent Grass Filing 2\CAD\SB Bent Grass\CLH014.20_CVs\Cover Sheet.dwg, Xavi Nisbet, 3/5/2026