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ARCHITECTURE LLC
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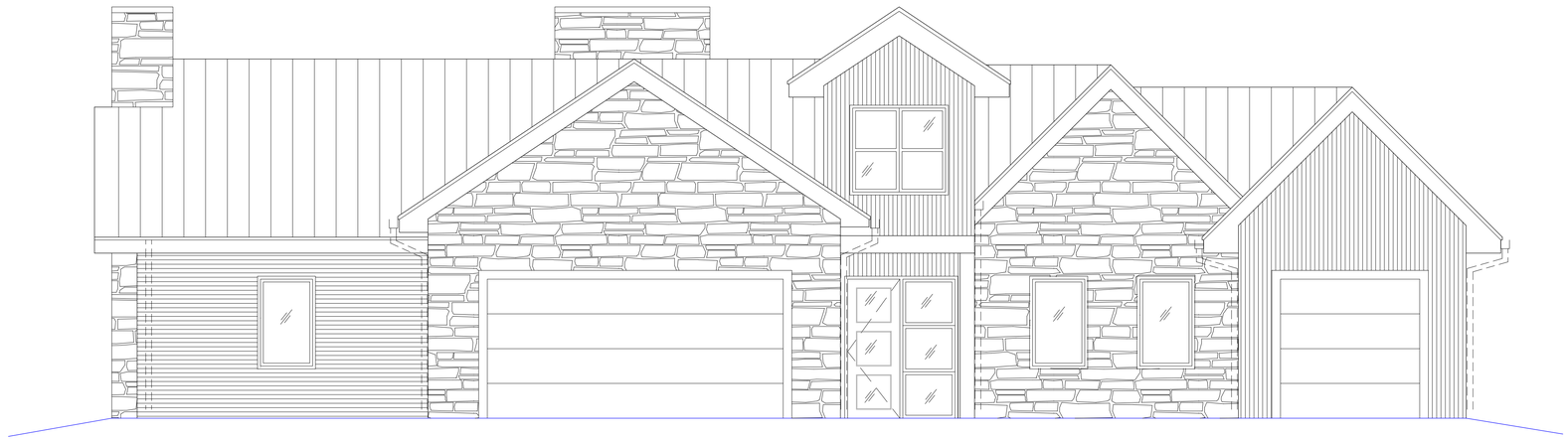
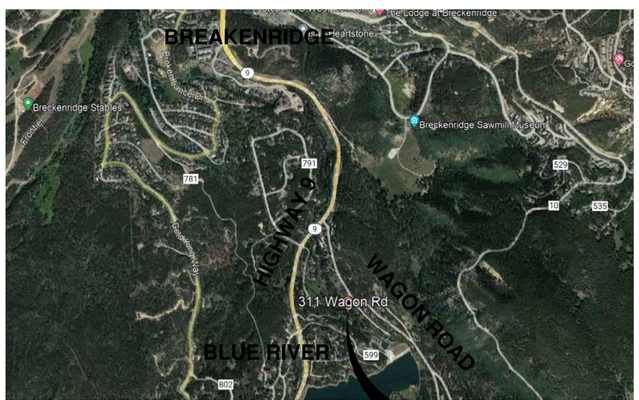


Blue River Mountain Home

311 Wagon Road, Blue River, CO 80424

LOCATION MAP



SETS ISSUED:

04.14.23 FOR PERMIT

CONTACTS

PRESENTED BY

405 Front Street
Comfort, TX 78013
830-741-3400
Landyn Hacketbeil
llandyn@ttcustomhomes.com

ARCHITECT

ROSE-VILLACORTE ARCHITECTURE LLC
480 N Sam Houston Parkway E, Suite 110
Houston TX 77060
346-498-3808
Timothy Paul Rose, Architect #26947
timothy@rvaarch.com

STRUCTURAL ENGINEER

Sarab Structural & Civil LLC
13831 Northwest Freeway, Suite 245
Houston, TX 77040
832-922-1145
Karim S. Dadelahi P.E.
sscllc@sarabstructural.com

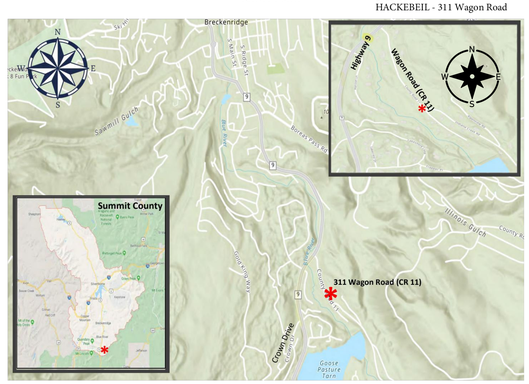
CIVIL ENGINEER

Littlehorn Engineering LLC
351 U.C. Highway 285
Fiarplay, CO 80440
719-836-7120
John J Littlehorn P.E.

ELECTRICAL ENGINEER

n/a

DRAWING INDEX



LITTLEHORN
ENGINEERING &
SURVEYING

CIVIL SITE AND GRADING PLANS FOR A SINGLE-FAMILY RESIDENCE

#2

311 WAGON ROAD, TOWN OF BLUE RIVER, CO

A PERMIT IS REQUIRED FROM THE TOWN OF BLUE RIVER TO
EXCAVATE & INSTALL A DRIVEWAY AND EXCAVATE ON THIS SITE
AND FROM SUMMIT COUNTY FOR THE OWTS RELATED WORK

PROPERTY INFORMATION
311 WAGON ROAD
BLUE RIVER, CO 80424
SPILLWAY SUB. #1, LOT 14

BUILDING ARCHITECT:
ROSE-VILLACORTE ARCHITECTURE, LLC
480 NORTH SAM HOUSTON PARKWAY EAST, SUITE 110
HOUSTON, TX 77060
OFFICE # (346) 498-3808

DRAWING PREPARED FOR:
LANDYN AND MICHELLE HACKEBEIL
405 FRONT STREET
COMFORT, TX 78013

CONTRACTOR:

TBD

CONSTRUCTION NOTES - *Construction notes shall govern ALL civil drawings*

GENERAL CONSTRUCTION AND PROJECT NOTES

1. PERMITS. IT IS THE OWNER'S AND CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL RETAINING WALLS ARE INSTALLED APPROPRIATELY AND WITH THE PERMISSION OF THE COUNTY AND H.O.A AND SOMETIMES THE FIRE DEPARTMENT (VERIFY). THE CONTRACTOR IS RESPONSIBLE FOR PROCUREMENT OF ALL NECESSARY PERMITS. COUNTY AND FIRE ACCESS REQUIREMENTS FOR DRIVEWAY STANDARDS MUST BE MET. IF SITE DISTURBANCE RESULTS IN MORE THAN 1.0 ACRES OF DISTURBANCE, A PERMIT FROM THE STATE OF COLORADO IS REQUIRED.

2. GREAT CARE AND PROFICIENCY HAVE GONE INTO THE PREPARATION OF THESE PLANS AND BLUE PRINTS. HOWEVER, DUE TO THE IMPOSSIBILITY OF PROVIDING "ON-SITE" SUPERVISORY CONTROL OVER ACTUAL CONSTRUCTION AND BECAUSE OF GREAT VARIATIONS IN LOCAL BUILDING CODES, SOILS, GROUNDWATER, BUILDING CONDITIONS, AND WEATHER CONDITIONS, THE ENGINEER ASSUMES NO LIABILITY EXCEPT AS DESCRIBED IN THE CONTRACT FOR PROFESSIONAL SERVICES. THE ENGINEER HAS DESIGNED THE PROJECT FROM GENERALLY ACCEPTED ENGINEERING PRACTICES AS IS TYPICAL IN THE LOCAL AREA TO ASSURE THAT THE DESIGNED ITEMS ARE SOUND.

3. DISCREPANCIES IN BUILDING PLANS OFTEN EXIST, THEREFORE THE HOME OWNER AND THE CONTRACTOR MUST INTERPRET THE BLUE PRINTS AND VERIFY PRIOR TO CONSTRUCTION COMMENCEMENT: SITE CONDITIONS, CONSTRUCTION SETBACKS, BUILDING LOCATION, DIMENSIONS, MATERIALS, COLORS, QUANTITIES, ELEVATIONS, AND FINISHES. ALL WORK SHALL COMPLY WITH APPLICABLE GOVERNING CODES, BUILDING DEPARTMENT ORDINANCES, LAWS, AND MANUFACTURERS' SPECIFICATIONS. ANY CHANGES OR ITEMS REQURIED FOR CONSTRUCTION WHICH ARE NOT CLEAR SHALL BE REPORTED TO THE ENGINEER (& OTHER DESIGNERS/SURVEYORS) FOR APPROVAL.

4. THESE PLANS ARE NOT AN INSTALLATION MANUAL AND DO NOT SHOW ALL DETAILS AND HAVE NOT AND CAN NOT CONSIDER EVERY CONCEIVABLE EVENT WHICH MAY OCCUR, AS THAT WOULD RENDER THE DESIGN AND FABRICATION OF THE PROJECT EXCESSIVELY EXPENSIVE. APPLICABLE INSTALLATION MANUALS AND CODES, AS LISTED IN THE SECTION LABELED "CODES", MUST BE REFERENCED AND USED FOR CONSTRUCTION. USE OF THESE DRAWINGS CONSTITUTES ACCEPTANCE OF RESPONSIBILITY FOR HAVING READ AND FULLY UNDERSTOOD THE CONSTRUCTION DRAWINGS AND THE ENGINEER'S LIABILITY. IF THE CLIENT OR CONTRACTOR HAS ANY QUESTIONS, PLEASE CONTACT THE ENGINEER PRIOR TO FABRICATION.

5. LOCATE ALL BURIED UTILITIES PRIOR TO ANY CONSTRUCTION.

6. A SOILS ENGINEER SHALL VERIFY ALL SOILS BEFORE & DURING PLACEMENT OF ANY APPURTENANCES, RETAINING WALLS, ASPHALT, OR CONCRETE.

7. ALL MATERIALS SHALL BE PROTECTED WITH SUITABLE TEMPORARY WEATHER FACILITIES AS MAY BE REQUIRED TO PROTECT MATERIALS FROM DAMAGE DURING CONSTRUCTION.

8. JOB-SITE SAFETY IS BEYOND THE SCOPE OF THESE DRAWINGS AND THE ABILITY OF THE ENGINEER TO MANAGE. THE OWNER AND CONTRACTORS BEAR ALL RESPONSIBILITY FOR THEIR OWN SAFETY AND THE SAFETY OF EMPLOYEES, WORKERS, AND PASSERSBY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL METHODS OF CONSTRUCTION, INCLUDING TEMPORARY BRACING OR SHORING AS REQUIRED AND CONSTRUCTION SEQUENCING. CONTRACTOR SHALL PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH THE LINES AND DIMENSIONS OF THE CONTRACT DOCUMENTS AND SHALL PROVIDE FOR THE SAFETY OF THE WORKERS. SITE VISITS BY THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE.

9. WEATHER PROTECTION AND SNOW REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND OWNER.

10. DO NOT SCALE DRAWINGS. VERIFY LINES & DIMENSIONS ON STRUCTURAL DRAWINGS W/ ARCHITECTURAL DRAWINGS PRIOR TO ANY WORK. CALL ENGINEER FOR ANY DIMENSIONING QUESTIONS. DIMENSIONS ON DRAWINGS DO NOT ACCOUNT FOR FINISHES.

11. SUBMIT ALL SHOP DRAWINGS TO THE ENGINEER. ENGINEER'S REVIEW OF SHOP DRAWINGS IS PROVIDED AS AN AID TO THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEW AND CORRECTNESS OF SHOP DRAWINGS. SHOP DRAWINGS DO NOT REPLACE CONTRACT DOCUMENTS. SHOP DRAWINGS (ONLY REVIEWED UPON CLIENTS REQUEST) ARE SOMETIMES PROVIDED ON CULVERTS, FLARED END SECTIONS, GEOGRID FABRICS, FILTER FABRICS, SLOPE NETTING, EROSION WATTLES, AND OTHER SITE RELATED WORK.

12. OTHERS SUBMITTING ENGINEERED DESIGN AND LAYOUT SHALL BEAR RESPONSIBILITY FOR SUCH WORK. AS AN ENGINEER FOR THE DRIVEWAY ONLY, WE SHALL BE LISTED OR RECOGNIZED AS THE ENGINEER OF RECORD FOR THE ENTIRE PROJECT.

13. THE CONTRACTOR SHALL NOTIFY ENGINEER OF DETAILS NOT SHOWN ON PLANS THAT ARE NECESSARY FOR THE WORK TO PROCEED.

14. ALTERNATES PROVIDED FOR THE CONTRACTOR'S CONVENIENCE SHALL REQUIRE THE CONTRACTOR TO PROVIDE ALL CHANGES AND COORDINATE ALL DETAILS NECESSARY SHOULD THE CONTRACTOR CHOOSE AN ALTERNATE.

15. DRIVEWAYS: DRIVEWAYS SHALL CONFORM TO THE REQUIREMENTS OF THE COUNTY OR MUNICIPALITY WHICH INCLUDE THE DIMENSIONS OF DRIVEWAY WIDTHS, OPENINGS, AND THE CENTERLINE CURVE RADII. FOR THE TOWN OF BLUE RIVER THIS IS MAX. 6.0% FOR THE FIRST 20 FEET, THEN UP TO 12% WITH TOWN APPROVAL THEREAFTER. PARKING AREAS SHALL HAVE A MAXIMUM GRADE OF 4%, AND A MINIMUM GRADE OF 1.0% TO FACILITATE DRAINAGE. ALL GRADES MUST SLOPE AWAY FROM STRUCTURE REGARDLESS OF WHAT IS SHOWN ON ANY GRADING PLAN. DRAINAGE FROM DRIVEWAYS SHALL BE DIVERTED TO ROADSIDE DITCHES OR OTHER APPROPRIATE DRAINAGE WAY.

16. PLEASE NOTE THAT ANY TIME A DRIVEWAY IS CUT INTO THE HILL SIDE FROM THE DIRECTION OF THE PREVAILING WINDS, DRIFTING WILL OCCUR. THIS DRIFTING AND SNOW BUILD-UP MAY MAKE THE DRIVE IMPASSABLE IN THE WINTER.

17. PARKING AND DRIVEWAY SURFACES: RECYCLED ASPHALT, PAVING, OR CONCRETE IS USUALLY RECOMMENDED TO FACILITATE SNOW REMOVAL. PAVING IS NOT REQUIRED FOR PARKING AREA AND DRIVES SERVING SINGLE-FAMILY UNITS, OR FOR DUPLEXES WHERE THE ROAD PROVIDING ACCESS IS NOT PAVED. WHERE ROADS ARE PAVED, PARKING AREAS AND DRIVES FOR DUPLEXES MUST BE PAVED. PARKING AREAS NOT PAVED SHALL BE COVERED WITH 1-2 INCHES OF DRIVEWAY GRAVEL OR 2 INCHES OF RECYCLED ASPHALT (OWNER TO SPECIFY). WHEN PAVING IS USED, VERIFY ALL UNDERLYING SOILS WITH GEOTECH.

18. PARKING STANDARDS: PARKING SHALL CONFORM TO COUNTY AND ANY APPLICABLE HOA REQUIREMENTS. FIELD VERIFY THE NUMBER OF PARKING SPACES REQUIRED.

19. WHENEVER ROADWAYS, DRIVEWAYS, PARKING AREA, BRIDGES, REC. PATHS OR OTHER TYPES OF CONSTRUCTION RESULT IN EARTH DISTURBANCE, REVEGETATION AND/OR LANDSCAPING IS REQUIRED. REVEGETATION AND/OR LANDSCAPING WORK SHALL BE IN ACCORDANCE WITH THE COUNTY LAND USE AND DEVELOPMENT CODE AND IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AS PART OF PERMIT ISSUANCE.

20. HISTORICAL FLOW QUANTITIES AND PATTERNS SHALL BE VERIFIED AND MAINTAINED. CHANGES TO SITE DRAINAGE CAN CAUSE ADVERSE EFFECTS TO NEIGHBORING PROPERTIES.

21. SNOW STACK SPACE: SNOW STORAGE FOR DRIVEWAYS SHALL BE PROVIDED ON THE OWNER'S PROPERTY. USE OF THE RIGHT-OF-WAY FOR SNOW STORAGE BY PRIVATE INDIVIDUALS OR COMPANIES IS PROHIBITED (C.R.S. 43-5-303). SNOW STORAGE AREA IS SHOWN ON SITE PLAN.

22. IF EARTH DISTURBANCE RESULTS IN CUT OR FILL SLOPES THAT CAN NOT BE TAPERED BACK INTO EXISTING GRADES AT THE GRADES SHOWN HEREIN, A RETAINAGE SYSTEM SHALL BE REQUIRED. IF THE PROPOSED RETAINING SYSTEM IS LESS THAN 4.0 FT IN HEIGHT, A DETAIL OF THE PROPOSED RETAINING SYSTEM MUST BE PROVIDED TO THE COUNTY FOR THEIR APPROVAL, PRIOR TO INSTALLATION.

23. LOCATE BUILDINGS PER COUNTY REGULATIONS AND WHEN APPLICABLE, SUBDIVISION REGULATIONS. BOTH HAVE BUILDING SETBACKS AND STANDARDS AND BOTH SHALL BE CONSULTED PRIOR TO CONSTRUCTION.

24. TREE CLEARING SHALL BE COMPLETED IN ACCORDANCE WITH FIRE REGULATIONS, SUBDIVISION REGULATIONS (WHEN APPLICABLE), AND COUNTY REGULATIONS.

25. MINOR GRADE CHANGES MAY BE MADE ON-SITE TO MEET SITE CONDITIONS, HOWEVER, COUNTY AND HOA STANDARDS MUST BE MAINTAINED.

26. EROSION CONTROL SYSTEMS ARE ILLUSTRATIVE AND SHALL BE VERIFIED BY OTHERS TO MEET ACTUAL CONSTRUCTION NEEDS.

VICINITY MAP

2022-100742
HACKEBEIL - 311 Wagon Road

VEHICLE CONSTRUCTION ENTRANCE

1. WHEN CONSTRUCTION VEHICLES LEAVE ACTIVE CONSTRUCTION AREAS, SEDIMENT CONTROLS SHALL BE INSTALLED TO CONTROL SEDIMENT FROM LEAVING THE SITE. A TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED AND SHALL CONSIST OF A STONE PAD OR EQUIVALENT CONTROL MATS LOCATED WHERE VEHICLES WILL LEAVE THE CONSTRUCTION SITE. THE PAD SHALL CONSIST OF AT LEAST 6 INCHES OF LARGE GRAVEL OR RIP RAP. THE PAD/OR ROCK ENTRANCE SHOULD BE AT LEAST 25 FT LONG; HOWEVER, LONGER ENTRANCES MAY BE REQUIRED TO ADEQUATELY CLEAN TIRES. GEOTEXTILE FABRIC MAY BE NEEDED UNDER THE ROCK TO PREVENT MIGRATION OF MUD FROM THE UNDERLYING SOIL INTO THE STONE. IF TIRES ARE CLEANED WITH WATER, THE WASH WATER SHOULD BE DIRECTED TO A SUITABLE SETTLING AREA. WHEN REQUIRED, A PIPE OR CULVERT AND/OR SMALL BERM SHALL BE CONSTRUCTED AT THE ENTRANCE.

2. MONITORING AND MAINTENANCE: VEHICLE CONSTRUCTION PADS SHALL BE INSPECTED BY THE CONTRACTOR AS NEEDED AND AFTER RAIN ACTIVITIES. ANY EVIDENCE OF EROSION PROBLEMS SHALL BE REPAIRED AS QUICKLY AS POSSIBLE. SEDIMENT SHALL BE REMOVED AS APPROVED AND DISPOSED OF OUTSIDE THE FLOODPLAIN, WETLANDS AND BUFFER AREAS IN AN APPROVED DISPOSAL SITE OR FILL AREA AND THEN STABILIZED. WHENEVER THE EXISTING ROCK (OR MATS) BECOME BURIED OR FILLED WITH MUD, THE PAD WILL REQUIRE TOP-DRESSING WITH ADDITIONAL ROCK, OR REMOVAL AND RE-INSTALLATION. AREAS USED FOR SEDIMENT TRAPPING ALSO NEED TO BE CLEANED ROUTINELY. IF CONDITIONS ON THE SITE ARE SUCH THAT THE MAJORITY OF THE MUD IS NOT REMOVED BY THE VEHICLES TRAVELING OVER THE GRAVEL, ADDITIONAL SEDIMENT TRACKING CONTROL MEASURES SHOULD BE ADDED TO PREVENT THE TRACKING OF MUD OR DIRT ONTO THE PUBLIC ROADWAY.

ELECTRICAL/PLUMBING/MECHANICAL SYSTEMS

1. THESE SYSTEMS ARE NOT BE WITHIN THE SCOPE OF THESE PLANS THOUGH THESE SYSTEMS SHOULD BE ENGINEERED. THE ENGINEER CAN NOT ACCEPT ANY RESPONSIBILITY WITH REGARD TO THESE SYSTEMS. ALL DESIGN AND INSTALLATION DETAILS ARE THE RESPONSIBILITY OF THE OWNER, BUILDER AND THEIR CONTRACTORS. IF THE CLIENT CHOOSES, THESE SYSTEMS CAN BE PROFESSIONALLY ENGINEERED. FOLLOW MANUFACTURER'S AND BUILDING MUNICIPALITY MECHANICAL, PLUMBING, AND ELECTRICAL CODES WHEN INSTALLING THESE SYSTEMS.

HIGH DENSITY POLYETHYLENE PIPE (HDPE) - CULVERT PIPE

1. CULVERTS SPECIFIED SHALL BE APPROVED HIGH DENSITY POLYETHYLENE PIPE (HDPE) OR CORRUGATED METAL TYPE PIPE (CMP). WHEN CULVERTS ARE INSTALLED IN THE COUNTY RIGHT OF WAY THE CONTRACTOR SHALL VERIFY THE CULVERT TYPE WITH THE COUNTY BEFORE INSTALLATION.

2. ALL HDPE PIPE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS: A) THICKNESS ASTM D751 & D1593, B) DENSITY ASTM D1505, C) TENSILE ASTM D638, D) PUNCTURE RESISTANCE ASTM FTMS101C METHOD 2065, E) LOW TEMPERATURE BRITTLENESS ASTM D746, F) ENVIRONMENTAL STRESS CRACK RESISTANCE ASTM D5397.

3. PIPE SHOULD BE STOCKPILED ON LEVEL GROUND AND IF STACKED, BLOCKING SHOULD BE PROVIDED TO PREVENT ROLLING. STACKED PIPE SHOULD BE PLACED TO PREVENT DEFORMING AND DAMAGE. ALL MATERIALS SHALL BE PROPERLY STORED.

4. TRENCHING SHOULD BE COMPLETED IN EXISTING SOILS WITH SIDEWALLS REASONABLY VERTICAL TO THE TOP OF THE PIPE. FOR POSITIVE PROJECTION EMBANKMENT INSTALLATIONS, WHEN EXCAVATION DEPTHS OR SOIL CONDITIONS REQUIRE SHORING OR USE OF A TRENCH BOX, THE BOTTOM OF THE SHORING OR TRENCH BOX SHOULD BE PLACED NO LOWER THAN THE TOP OF THE PIPE. THE FOLLOWING TRENCH WIDTH ARE RECOMMENDED TRENCH WIDTHS FOR MOST INSTALLATIONS TO PERMIT PROPER PLACEMENT AND COMPACTION OF BACKFILL MATERIAL IN THE HAUNCHES AND AROUND THE PIPE.

PIPE DIAMETER	TRENCH WIDTH
12"	31"
15"	34"
18"	39"
24"	48"
30"	66"

5. EMBEDMENT MATERIALS ARE THOSE USED FOR BEDDING, HAUNCHING AND INITIAL BACKFILL. ALL EMBEDMENT MATERIALS SHOULD BE FREE FROM LUMPS OF FROZEN SOIL, DEBRIS, STICKS, WOOD, AND ICE WHEN PLACED. ADDITIONALLY, EMBEDMENT MATERIALS SHOULD BE PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT. FOR THIS PROJECT WE RECOMMEND CLASS I, CLASS II, OR CLASS III FOR EMBEDMENT MATERIALS (CLASS I - ANGULAR CRUSHED STONE OR ROCK, DENSE OR OPEN GRADED WITH LITTLE OR NO FINES (1/4 INCH TO 1 1/2 INCHES IN SIZE; CLASS II - CLEAN, COARSE GRAINED MATERIALS, SUCH AS GRAVEL, COARSE SANDS AND GRAVEL/SAND MIXTURES (1 1/2 INCHES MAXIMUM IN SIZE); CLASS III - COARSE GRAINED MATERIALS WITH FINES INCLUDING SILTY OR CLAYEY GRAVELS OR SANDS. GRAVEL OR SAND MUST COMPRISE MORE THAN 50 PERCENT OF CLASS III MATERIALS (1 1/2 INCHES MAXIMUM SIZE).

6. PIPE FOUNDATION: THE TRENCH BOTTOM SHALL BE FREE OF ICE, SNOW, AND DEBRIS AND BE CAPABLE OF SUPPORTING 2500 PSF.

7. THOROUGHLY CLEAN THE BELL AND SPIGOT ENDS PER MANUFACTURER'S RECOMMENDATIONS.

8. REMOVE SHIPPING COLLARS (WHERE PROVIDED) PRIOR TO LOWERING THE PIPE IN THE TRENCH. PROPERLY DISPOSE OF SHIPPING COLLARS OUTSIDE THE PIPE TRENCH. DO NOT INSTALL PIPE WITH SHIPPING COLLARS ON THE PIPE AND DO NOT DISPOSE OF SHIPPING COLLARS IN THE TRENCH.

9. LUBRICANT SHOULD BE LIBERALLY APPLIED TO BOTH THE BELL AND SPIGOT ENDS OF THE PIPE. CARE SHOULD BE TAKEN TO ENSURE LUBRICANT IS APPLIED TO THE CHAMFERED LEADING EDGE OF THE BELL.

10. ALIGN THE PIPE AND PUSH THE SPIGOT HOME ON GRADE. JOINTS SHOULD BE INSTALLED WITH BELLS FACING UPSTREAM FOR PROPER INSTALLATION. GENERALLY, PIPES SHOULD BE LAID STARTING AT THE DOWNSTREAM END AND WORKING UPSTREAM. SMALL DIAMETER PIPE (BELOW 24") CAN USUALLY BE INSTALLED BY PUSHING THE JOINT HOME BY HAND. LARGER DIAMETERS MAY NECESSITATE USING A BAR OR EQUIPMENT TO PUSH HOME. IF A BAR OR EQUIPMENT IS UTILIZED A WOOD BLOCK SHOULD BE USED TO PREVENT DAMAGE TO THE BELL. WHEN PUSHING THE JOINT HOME, MAKE SURE BEDDING MATERIAL IS NOT PULLED INTO THE BELL BY THE SPIGOT. MATERIAL SUCH AS SMALL STONES AND SAND PULLED INTO THE BELL AS THE PIPE IS JOINED CAN CAUSE LEAKS.

11. MINIMUM COVER: CULVERTS ARE TYPICALLY PROVIDED WITH AT LEAST 12 INCHES (MEASURED FROM THE TOP OF THE PIPE TO THE GROUND SURFACE) OF SUITABLE, COMPACTED SOIL COVER FOLLOWED BY DRIVEWAY GRAVEL OR ASPHALT (REF. PLAN). IF 12 INCHES CAN NOT BE MAINTAINED, CULVERT DISPLACEMENT MAY OCCUR.

SURVEY NOTES

1. ANY BOUNDARY PINS OR CORNERS & TOPOGRAPHY IN QUESTION SHALL BE VERIFIED. IF CHANGES TO THE CIVIL DRAWINGS ARE REQUIRED, THE ENGINEER SHOULD BE NOTIFIED IMMEDIATELY AND PRIOR TO CONSTRUCTION IF POSSIBLE. FOR THIS PROJECT THE BOUNDARY AND TOPOGRAPHIC SURVEY WERE COMPLETED BY OTHERS.

2. EXISTING CONTOURS: EXISTING CONTOURS ARE SHOWN. LITTLEHORN IS NOT RESPONSIBLE FOR DEFECTS IN THE TOPOGRAPHIC SURVEY WHEN THE SURVEY IS PERFORMED BY OTHERS.

GRADING AND MATERIAL SPECIFICATIONS

1. A PRE-GRADING MEETING WITH THE SITE OWNER, PROJECT ENGINEER AND CONTRACTOR IS HIGHLY RECOMMENDED AND SHOULD BE PERFORMED TO FACILIATE PROJECT INSTALLATION.

2. WHEN THE GRADING OPERATIONS ENCOUNTER REMAINS OF PREHISTORIC PEOPLE'S DWELLING SITES, REMAINS, OR ARTIFACTS OF HISTORICAL, PALEONTOLOGICAL OR ARCHAEOLOGICAL SIGNIFICANCE, THE OPERATIONS SHALL BE TEMPORARILY DISCONTINUED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND PROMPTLY CONTACT THE PROPER AUTHORITIES TO DETERMINE THE DISPOSITION THEREOF. IF REQUIRED BY STATE OR FEDERAL AUTHORITIES, THE CONTRACTOR SHALL PRESERVE THE AREA OF SIGNIFICANCE TO ALLOW AUTHORITIES TO EXCAVATE AND RECOVER THE ITEMS OF SIGNIFICANCE.

3. AT ALL TIMES, PRECAUTIONS SHALL BE TAKEN FOR THE PROTECTION OF CULVERTS, EROSION CONTROL STRUCTURES, IRRIGATION CROSSINGS, MAIL BOXES, DRIVEWAY APPROACHES, VALVE BOXES, MANHOLES, SURVEY MONUMENTS, UNDERGROUND OR OVERHEAD UTILITY LINES AND ALL OTHER PUBLIC OR PRIVATE INSTALLATIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. ANY DAMAGE TO SUCH STRUCTURES SHALL BE REPAIRED, DOCUMENTED AND SUBMITTED TO THE APPROPRIATE AUTHORITY PRIOR TO ISSUANCE OF ANY CERTIFICATE OF COMPLETION FOR THE SITE.

4. CLEARING AND GRUBBING: CLEARING AND GRUBBING CONSISTS OF REMOVING AND DISPOSING OF ALL VEGETATION AND DEBRIS WITHIN THE LIMITS OF THE APPROVED GRADING PLANS WHERE THE DRIVEWAY, SOIL TREATMENT AREA, HOUSE, WELL/WELL LINES, AND WASTEWATER LINES ARE TO BE LOCATED. CLEARING AND GRUBBING SHALL BE PERFORMED ONLY WHERE NECESSARY. THE PRESERVATION OF ALL VEGETATION AND ANY OTHER TREES AND OBJECTS SHOULD REMAIN WHERE FEASIBLE AND AS OUTLINED AND WITHIN LOCAL FIRE DEPARTMENT RECOMMEMNDATIONS. STUMP HOLES AND OTHER HOLES FROM WHICH OBSTRUCTIONS ARE REMOVED, SHALL BE BACKFILLED WITH SUITABLE MATERIALS AND COMPACTED AS REQUIRED. MATERIALS AND DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE AND COUNTY REGULATIONS. WITH OWNER'S AND COUNTIES PERMISSION, ROOTS MAY BE BURIED ON-SITE.

5. TOPSOIL: ALL TOPSOIL, WHERE PHYSICALLY PRACTICABLE, SHALL BE SALVAGED. TOPSOIL SHALL CONSIST OF LOOSE FRIABLE LOAM REASONABLY FREE OF ADMIXTURES OF SUBSOIL, REFUSE, STUMPS, ROOTS, ROCKS, BRUSH, WEEDS, OR OTHER MATERIAL WHICH WOULD BE DETRIMENTAL TO THE PROPER DEVELOPMENT OF VEGETATIVE GROWTH. MATERIALS SELECTED FOR TOPSOIL AND LYING WITHIN THE LIMITS OF THE PROJECT SHALL BE EXCAVATED AND STOCKPILED AS REQUIRED AND WHERE PERMISSIBLE. TOPSOIL SHALL BE PLACED AND SPREAD AT LOCATIONS AND TO THE THICKNESS SHOWN ON THE PLANS AND SHALL BE KEYED TO THE UNDERLYING MATERIALS BY THE USE OF HARROWS, ROLLERS, OR OTHER EQUIPMENT SUITABLE FOR THE PURPOSE. FOR SITES THAT DON'T CONTAIN ENOUGH REUSABLE TOP SOIL, APPROVED TOP SOIL WILL HAVE TO BE IMPORTED TO THE SITE.

6. GENERAL EXCAVATION AND EMBANKMENT: EXCAVATION AND EMBANKMENT GRADING CONSISTS OF EXCAVATION, DISPOSAL, SHAPING, OR COMPACTION OF ALL MATERIAL ENCOUNTERED WITHIN THE LIMITS OF THE GRADING PLANS INCLUDING EXCAVATION FOR DITCHES AND CHANNELS NECESSARY FOR THE CONSTRUCTION OF THE PROJECT IN ACCORDANCE WITH THE GRADING PLANS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, AND TYPICAL CROSS-SECTIONS SHOWN ON THE PLANS. THE EXCAVATION AND EMBANKMENTS SHALL BE FINISHED TO REASONABLY SMOOTH AND UNIFORM SURFACES. GRADING OPERATIONS SHALL BE CONDUCTED SO THAT MATERIAL OUTSIDE OF THE LIMITS OF SLOPES WILL NOT BE DISTURBED. PRIOR TO BEGINNING GRADING OPERATIONS IN ANY AREAS, ALL NECESSARY CLEARING AND GRUBBING AND TOPSOIL IN THAT AREA SHALL HAVE BEEN PERFORMED IN ACCORDANCE WITH THE CLEARING AND GRUBBING AND TOPSOIL PROVISIONS. WHERE MATERIAL ENCOUNTERED WITHIN THE LIMITS OF GRADING ARE CONSIDERED UNSUITABLE FOR EMBANKMENT FOUNDATIONS, STREETS/ROADS, OR STRUCTURAL AREAS BY THE SOILS ENGINEER, SUCH MATERIAL SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL. SOME EXAMPLES OF UNSUITABLE MATERIAL INCLUDE SOILS WHICH CONTAIN SIGNIFICANT AMOUNTS OF ORGANIC MATERIAL AND/OR LARGE DIAMETER ROCKS, CONCRETE, OR ASPHALT. EXCESS UNSUITABLE EXCAVATED MATERIAL, INCLUDING ROCK AND BOULDERS, THAT CANNOT BE USED IN EMBANKMENTS MAY BE PLACED IN NON-STRUCTURAL AREAS AS APPROVED BY THE SOILS ENGINEER.

7. UTILITIES: WHEN UTILITY DEVICES ARE TO BE INSTALLED WITHIN THE COUNTY OR TOWN'S ROAD RIGHT-OF-WAY, THE COUNTY OR TOWN POLICY ON UTILITY USE OF COUNTY RIGHTS-OF-WAY SHALL APPLY. BEFORE BEGINNING ANY EXCAVATION, CALL FOR A UTILITY LOCATE.

8. TRAFFIC CONTROL: APPROVED BARRICADES, WARNING SIGNS, AND FLAGMEN SHALL BE USED AS NECESSARY.

9. DRIVEWAY SUBBASE: ALL MATERIAL SHALL BE OF SOUND PARTICLES AND SHALL BE FREE OF ORGANIC MATTER. COMPACTION OF MATERIAL SHALL BE VERIFIED BY THE ENGINEER BEFORE PLACEMENT OF CONCRETE, ASPHALT, TANKS, PIPES, OR OTHER STRUCTURES. SUBBASE AND BASECOURSE SHALL BE COMPACTED AS REQUIRED FOR STRUCTURAL FILL (SEE COMPACTION REQUIREMENTS). THE SUBBASE IS CONSIDERED THE NATIVE SOIL OR IMPORTED, APPROVED, STRUCTURAL FILL. IF SUBBASE DEPTHS EXCEED 12 INCHES, CONTACT THE ENGINEER FOR INSPECTION AND COMPACTION TESTING. THE SUBBASE SHALL BE FREE OF STICKS, ROCKS LARGER THAN 8 INCHES IN DIAMETER, SNOW, ICE, AND OTHER DEBRIS.

10. SURFACE COURSE: INSTALL A THIN CRUSHED AGGREGATE SURFACE COURSE UNDER ALL PAVED AREAS. THE SURFACE COURSE IS USUALLY 1/2-INCH TO 2 INCHES IN DEPTH. SURFACE COURSE SHALL BE 1"-MINUS MATERIAL AND MUST BE A HARD ROCK CRUSHED AGGREGATE WITH:

SIEVE SIZE	% PASSING
1"	100
#4	5-15
#10	0-8
#200	0-4

11. WATERING: WATER SHALL BE APPLIED TO THE TOPSOIL AT THE LOCATIONS AND IN THE AMOUNTS WHERE REQUIRED. WATER SHALL BE APPLIED IN A FINE SPRAY BY NOZZLES OR SPRAY BARS IN SUCH A MANNER THAT IT WILL NOT WASH OR ERODE THE TOPSOIL AREA. ALL WATER USED SHALL BE FREE OF ANY MINERAL SALTS OR CONTAMINATING MATERIAL WHICH MIGHT RESULT IN EXPANSION OF MATERIALS AFTER PLACEMENT. SPRINKLING EQUIPMENT SHALL BE OF A TYPE WHICH ENSURES UNIFORM AND CONTROLLED DISTRIBUTION OF WATER WITHOUT PONDING OR WASHING. DUST PALLIATIVES SHALL BE APPLIED ON PORTIONS OF THE PROJECT AND ON HAUL ROADS AT THE LOCATIONS AND IN THE AMOUNTS AS MAY BE NECESSARY AND AS APPROVED. DUST PALLIATIVES MAY CONSIST OF WATER OR OTHER SUBSTANCES APPROVED BY THE COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT. WATER USED IN LANDSCAPING SHALL BE PROVIDED FOR SEEDING, MULCHING, PLANTING, TRANSPLANTING, SODDING, AND SOIL STERILIZATION, AND ANY OTHER LANDSCAPING WORK AS REQUIRED.

12. COMPACTION: FIELD DENSITY TESTS SHALL BE MADE BY THE SOILS ENGINEER AS SPECIFIED IN THE SOILS REPORT. WHEN A SOILS REPORT DOES NOT EXIST, CONTACT LITTLEHORN FOR TESTING REQUIREMENTS. WHEN TESTING IS NOT PERFORMED IN ROADWAYS, IN EXCAVATED TRENCH AREAS, AND AROUND TANKS AND THE HOUSE, SETTLEMENT IS LIKELY.

13. SLOPE STANDARDS: CUT SLOPES (I.E., EXCAVATED SLOPES) SHALL BE NO STEEPER THAN TWO (2) HORIZONTAL TO ONE (1) VERTICAL UNLESS SPECIFICALLY IDENTIFIED OTHERWISE IN THESE PLANS. FILL SLOPES SHOULD NOT EXCEED TWO (2) HORIZONTAL TO ONE (1) VERTICAL OR AS SPECIFIED IN THE PLANS. ALL PERMANENT CUT AND FILL SLOPES SHALL BE CONSTRUCTED AT SLOPES WHICH ENSURE LONG TERM SLOPE STABILITY AND THAT WILL NOT CAUSE ACCELERATED EROSION. THE TOPS AND TOES OF CUT AND FILL SLOPES SHALL BE SET BACK FROM PROPERTY BOUNDARIES AS FAR AS NECESSARY FOR SAFETY OF THE ADJOINING PROPERTIES AND TO PREVENT DAMAGE RESULTING FROM WATER RUN-OFF OR EROSION OF THE SLOPE. THE TOPS AND TOES OF CUT AND FILL SLOPES SHALL BE SET BACK FROM STRUCTURES AS FAR AS IT IS NECESSARY FOR ADEQUACY OF FOUNDATION SUPPORT AND TO PREVENT DAMAGE AS A RESULT OF WATER RUN-OFF OR EROSION OF THE SLOPES. FOR SLOPES WHICH EXCEED 30%, TERRACES AT LEAST EIGHT (8) FEET IN WIDTH SHALL BE ESTABLISHED. AT LEAST A TWO (2) PERCENT GRADIENT SHALL BE MAINTAINED FROM BUILDING PADS TO DRAINAGE FACILITIES UNLESS OTHERWISE APPROVED.

14. GUARANTEES: ALL CONSTRUCTION SHALL BE GUARANTEED BY THE CONSTRUCTION FIRM OR CONSTRUCTING INDIVIDUAL FOR A MINIMUM OF ONE YEAR TO MEET THE CONTINUAL STANDARDS TO WHICH IT WAS CONSTRUCTED. SUCH GUARANTEE MAY BE BY BOND, CASH DEPOSIT, PLEDGED SECURITIES, OR OTHER VALUABLE CONSIDERATIONS ACCEPTABLE BY THE OWNER.

DESIGN CRITERIA AND OTHER NOTES

1. WIND LOADING ON RETAINING WALLS: Vult = 110 MPH, EXPOSURE C (90 MPH Vasd OR NOMINAL WIND - 2018 IRC)
PROVISONS FOR DETENTION POND NOT REVIEWED OR REQUIRED
PER THE TOWN OF BLUE RIVER STANDARD ACCEPTED EROSION CONTROL METHODS ARE USED
LANDSCAPING DESIGN REQUIREMENTS AND SPECIFICATIONS NOT REVIEWED

2. SOIL CONDITIONS FOR GRADING DESIGN AND THESE CIVIL DRAWINGS ARE BASED UPON THE SOILS REPORT BY LITTLEHORN ENGINEERING, DATED JANUARY 5, 2022:
POORLY GRADED SAND WITH SILT, GRAVEL, COBBLES AND BOULDERS
PASSIVE EQUIV. FLUID PRESSURE - 275 P.C.F. (DRAINED)
EQUIV. FLUID UNIT SOIL WEIGHT - 46 P.C.F. (DRAINED)
COEFFICIENT OF FRICTION - 0.35
ALLOWABLE BEARING PRESSURE - 2750 P.S.F. ON UNDISTURBED SOIL

SOILS CONDITIONS SHALL BE VERIFIED BY GEOTECH DURING CONSTRUCTION. CONTACT ENGINEER FOR INSPECTION OF ALL RETAINING WALLS, STRUCTURAL FILLS, AND ROCK LINED SWALES.

CIVIL SHEET INDEX

SHEET#	SHEET DESCRIPTION
C0	COVER SHEET & SITE CONSTRUCTION GENERAL NOTES
C1	PROPOSED OVERALL SITE PLAN WITH OVERALL DRIVEWAY AND PARKING AND SNOW REMOVAL
C1.1	PROPOSED SITE PLAN DETAIL WITH DRIVEWAY AND PARKING
C2	EROSION CONTROL PLAN
C3	SITE CONSTRUCTION DETAILS
C4	EROSION CONTROL SPECIFICATIONS & DETAILS
-	BUILDING HEIGHT ANALYSES IS BY OTHERS
-	
-	
-	
6	SHEETS TOTAL WITH COVER PAGE (24X36 SHEETS)

DIG SAFELY - CALL 811
GAS/ELECTRIC/TELEPHONE/CABLE
WWW.UNCC2.ORG

CODES GOVERNING MATERIALS AND WORKMANSHIP*

IRC 2018	INTERNATIONAL RESIDENTIAL BUILDING CODE
ACI	REINFORCED CONCRETE DETAILING MANUAL
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
AWWA	AMERICAN WATER WORKS ASSOCIATION
BRBD	BLUE RIVER BUILDING DEPARTMENT (BUILDINGS & SITE RELATED WORK EXCEPT FOR OWTS)
SCEHD	SUMMIT COUNTY COUNTY ENVIRONMENTAL HEALTH DEPARTMENT (WASTEWATER SYSTEM & DRIVEWAY)
BRPD	BLUE RIVER COUNTY PLANNING DEPARTMENT (SETBACKS, ZONING, ETC.)
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASSE	AMERICAN SOCIETY OF SANITARY ENGINEERS
MSDS	MATERIAL SAFETY DATA SHEETS

*ALL OF THE ABOVE CODES MAY NOT BE USED FOR CONSTRUCTION IN THE SPECIFIC PROJECT. WHEN APPLICABLE, THE CODE SHALL APPLY.

SOME ABBREVIATIONS USED IN THESE DRAWINGS

NOT ALL ABBREVIATIONS ARE USED IN THESE DRAWINGS. ABBREVIATIONS MAY OR MAY NOT CONTAIN PERIODS. THIS CHART IS FOR INFORMATION PURPOSES ONLY. CONTACT ENGINEER FOR ANY MISSING ABBREVIATIONS USED.

A.B.	ANCHOR BOLT	FG	FINISH GRADE	PLY.	PLYWOOD
ABV.	ABOVE	FIN.	FINISH(ED)	P.S.F.	POUNDS PER SQUARE FOOT
ADD'L	ADDITIONAL	FLR.	FLOOR	P.S.I.	POUNDS PER SQUARE INCH
A.F.F.	ABOVE FINISHED FLOOR	FDN.	FOUNDATION	P.T.	PRESSURE TREATED
A.F.G.	ABOVE FINISHED GRADE	FNDN.	FOUNDATION	PWR.	POWER (CABINET)
ALUM.	ALUMINUM	F.O.C.	FACE OF CONCRETE	QTY.	QUANTITY
ALT.	ALTERNATE	F.O.M.	FACE OF MASONRY	QUA.	QUARRY
APPRX.	APPROXIMATE(LY)	F.O.S.	FACE OF STUD	RAD.(R)	RADIUS
ARCH.	ARCHITECT(URAL)	F.O.W.	FACE OF WALL	REF.	REFERENCE OR REFER TO
AWG.	AMERICAN WIRE GAUGE	F.S.	FINISH SURFACE	REINF.	REINFORCEMENT(ING)
AWN.	AWNING	FT.(')	FOOT (FEET)	REQ'D.	REQUIRED
BLDG.	BUILDING	FTG.	FOOTING	RGS.	RIGID GALVANIZED STEEL
BLK.	BLOCK	GA.	GAUGE	R.S.	ROUGH SAWN
BM.	BEAM	GAL.	GALVANIZE(D)	SCH(D).	SCHEDULE
B.O.F.	BOTTOM OF FOOTING	GEN.	GENERAL	SF	SQUARE FEET
BOT	BOTTOM OF TANK	G.F.I.	GROUND FAULT CIRCUIT INTER.	SHT.	SHEET
BRG.	BEARING	GPS	GLOBAL POSITIONING SYSTEM	SIM.	SIMILAR
CAB.	CABINET	GPD	GALLONS PER DAY	SPEC.	SPECIFICATION(S)
CANT.	CANTILEVER(ED)	GRND.	GROUND	SQ.	SQUARE
C.I.P.	CAST IN PLACE	HORZ.	HORIZONTAL	S.S.	STAINLESS STEEL
CL	CENTERLINE	H OR HT.	HEIGHT	STA	SOIL TREAT. AREA (LEACH FIELD)
CLG.	CEILING	IN.(")	INCH(ES)	STD.	STANDARD
CLR.	CLEAR	INSUL.	INSULATION	STL.	STEEL
COL.	COLUMN	INT.	INTERIOR	STRUC.	STRUCTURAL
COMP.	COMPOSITE	LB.(#)	POUND(S)	T&B	TOP AND BOTTOM
CONC.	CONCRETE	L.B.	LAG BOLTS	T&G	TONGUE AND GROOVE
CONN.	CONNECTION(OR)	L.F.	LINEAR FEET (FOOT)	T.B.D.	TO BE DETERMINED
CONST.	CONSTRUCTION	L.	LONG(ITUDINAL) OR LENGTH	TEMP.	TEMPORARY OR TEMPERED
CONT.	CONTINUOUS	MAS.	MASONRY	THK.	THICK(NESS)
CSM'T.	CASEMENT	MAX.	MAXIMUM	THRU	THROUGH
DBL.	DOUBLE	M.B.	MACHINE BOLT	T.N.	TOE NAIL
DEPT.	DEPARTMENT	MECH.	MECHANICAL	T.O.C.	TOP OF CURB
DIA.(Ø)	DIAMETER	MFG.	MANUFACTURER	T.O.F.	TOP OF FOOTING
DIAG.	DIAGONAL	MFGR.	MANUFACTURER	T.O.M.	TOP OF MOUND
DIM.	DIMENSION	MIL.	MILLIMETER	T.O.P.	TOP OF PLATE (PARAPET)
DTL.	DETAIL	MIN.	MINIMUM	T.O.S.	TOP OF SLAB
DWG.	DRAWING(S)	MISC.	MISCELLANEOUS	TOS	TOP OF SAND (LEACH FIELD)
DWL.	DOWEL(S)	MTL.	METAL	T.O.R.	TOP OF RISER
EA.	EACH	N.I.C.	NOT IN CONTRACT	T.O.T.	TOP OF TANK
EL.	ELEVATION	NO.(#)	NUMBER	T.O.W.	TOP OF WALL
ELEC.	ELECTRICAL	N.T.S.	NOT TO SCALE	TRAN.	TRANSOM
ELEV.	ELEVATION OR ELEVATOR	O.C.	ON CENTER	TYP.	TYPICAL
E.N.	EDGE NAIL	OPNG.	OPENING	U.G.	UNDER GROUND
ENG.	ENGINEER	P/C	PRECAST CONCRETE	U.N.O.	UNLESS NOTED OTHERWISE
EOA	EDGE OF ASPHALT	PC	POINT OF CURVATURE	V.I.F.	VERIFY IN FIELD
EOG	EDGE OF GRAVEL	PED	PEDESTAL	VERT.	VERTICAL
EQ.	EQUAL	PERF.	PERFORATED	W	WIDE (WIDTH)
EXP.	EXPANSION	PLT.	PLATE	W/	WITH
EXIST.(E)	EXISTING	PL	PLATE	WD.	WOOD
EXT.	EXTERIOR	POB	POINT OF BEGINNING	W.P.	WEATHERPROOF
FAB.	FABRICATION(OR)	POI	POINT OF INTERSECTION	WT.	WEIGHT
F.D.	FLOOR DRAIN	PT	POINT OF TANGENT	W.W.M.	WOVEN WIRE MESH
F.F.	FINISH FLOOR				

04.10.2023

COVER SHEET & CONSTR. NOTES

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB#1, LOT 14

LITTLEHORN ENGINEERING & SURVEYING
"PEACE OF MIND THROUGH HOLISTIC DESIGN"

351 HIGHWAY 285, SUITE #201
FAIRPLAY, COLORADO 80440
MAIN OFFICE 719.836.7120
SILVER CLIFF PHONE 719.783.3757

PROJECT NO.
2022-100742

CLIENT
LANDYN AND
MICHELLE
HACKEBEIL

DATE
04.10.2023

REVISION:
△ -
△ -

C0

#3

LEGEND

3	RETAINING WALL HEIGHT (ABOVE (GRADE HEIGHT WITHOUT KEY)
—SS—	PROPOSED SEWER LINE
—W—	PROPOSED WATER LINE
	PROPOSED SILT FENCE
	PROPOSED STRAW WATTLE
	EXISTING CONTOUR
100	EXISTING CONTOUR LABEL
	PROPOSED CONTOUR
100	PROPOSED CONTOUR LABEL
	PROPERTY PIN
	ELEVATION POINT (0.1 FEET ±)
	UTILITY
	DRAINAGE ROUTE
14p	TREE TYPE & SIZE (PINE/ASPEN, Ø)
	PROPOSED SNOW STORAGE
	WETLANDS (IF DELINEATED)
	BLOCK RETAINING WALL
	BOULDER RETAINING WALL
	EXISTING ASPHALT ROADWAY
	PROPOSED GRAVEL ROADWAY

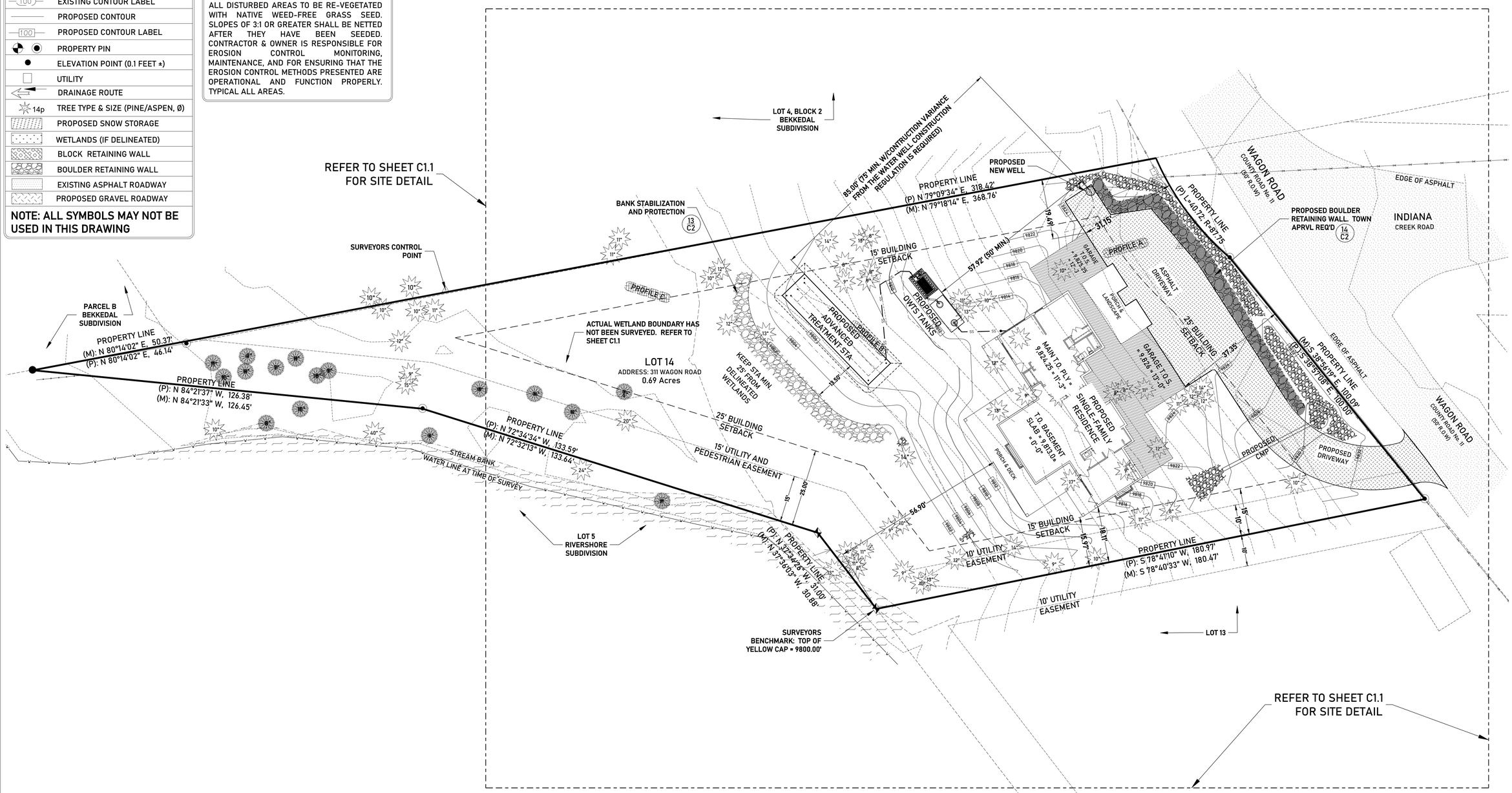
NOTE: ALL SYMBOLS MAY NOT BE USED IN THIS DRAWING

IN AREAS WHERE IT IS NOT POSSIBLE TO MAINTAIN A 1:1 CUT SLOPE, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL NECESSARY SHORING, BRACING, SLOPE STABILIZATION AND DRAINAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORKERS AS WELL AS MATERIALS AND WORKMANSHIP ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE DRAINAGE AND KEEPING THE SITE DE WATERED.

ALL DISTURBED AREAS TO BE RE-VEGETATED WITH NATIVE WEED-FREE GRASS SEED. SLOPES OF 3:1 OR GREATER SHALL BE NETTED AFTER THEY HAVE BEEN SEEDED. CONTRACTOR & OWNER IS RESPONSIBLE FOR EROSION CONTROL MONITORING, MAINTENANCE, AND FOR ENSURING THAT THE EROSION CONTROL METHODS PRESENTED ARE OPERATIONAL AND FUNCTION PROPERLY. TYPICAL ALL AREAS.

DRIVEWAY DESIGNED SLIGHTLY STEEPER THAN 10% (AND WITH RETAINING WALLS). ALL EFFORTS WERE MADE TO KEEP THE DRIVEWAY AT 10% MAX AND REDUCE THE FRONT RETAINING WALL HEIGHT; HOWEVER, THE NATURAL SITE GRADES, BEING OVER 30% IN MANY AREAS, AND THE HOUSE DESIGN DICTATED A STEEPER DRIVEWAY. A STEEPER DRIVEWAY DID REDUCE THE HOUSE HEIGHT. TOWN AND FIRE DEPARTMENT APPROVAL IS REQUIRED.

NOTE: ENTRANCE INTO THE RESIDENTIAL GARAGES MAY REQUIRE A 3-POINT TURN.



Site and Grading Plan

NOTE: 0'-0" ARCH = 9,813.00 USGS (VERIFY)

0' 15' 30' 45'

PLOTTED SCALE 1" = 15'

COLORADO REGISTERED JOHN L. LITTLEHORN PROFESSIONAL ENGINEER 04.10.2023

OVERALL SITE PLAN

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB#1, LOT 14

LITTLEHORN ENGINEERING & SURVEYING
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 HIGHWAY 285, SUITE #201
FAIRPLAY, COLORADO 80440
MAIN OFFICE 719.836.7120
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PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 -
2 -

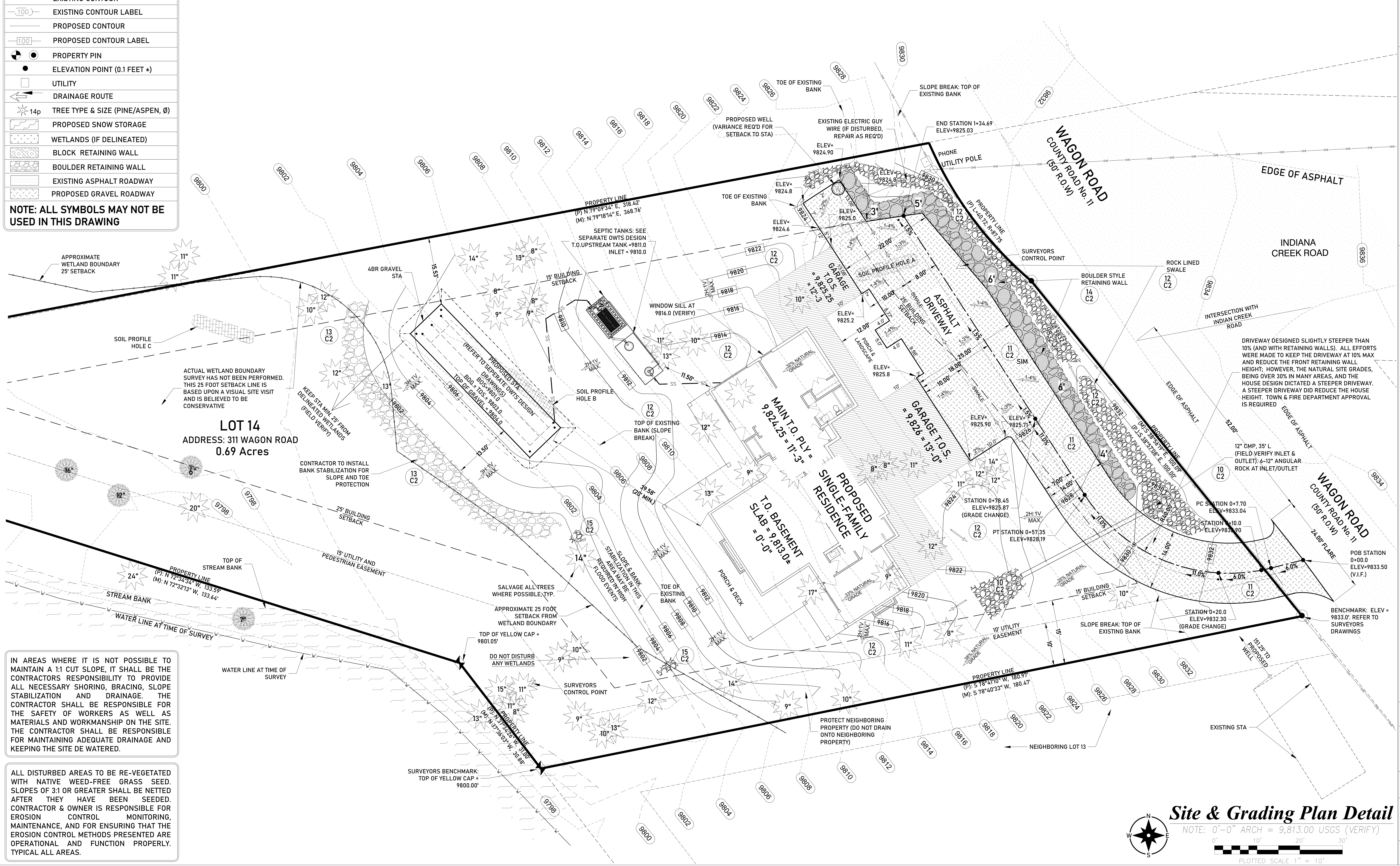
C1

#4

LEGEND

3	RETAINING WALL HEIGHT (ABOVE (GRADE HEIGHT WITHOUT KEY)
—SS—	PROPOSED SEWER LINE
—W—	PROPOSED WATER LINE
	PROPOSED SILT FENCE
	PROPOSED STRAW WATTLE
	EXISTING CONTOUR
—100—	EXISTING CONTOUR LABEL
	PROPOSED CONTOUR
—100—	PROPOSED CONTOUR LABEL
	PROPERTY PIN
	ELEVATION POINT (0.1 FEET ±)
	UTILITY
	DRAINAGE ROUTE
14p	TREE TYPE & SIZE (PINE/ASPEN, Ø)
	PROPOSED SNOW STORAGE
	WETLANDS (IF DELINEATED)
	BLOCK RETAINING WALL
	BOULDER RETAINING WALL
	EXISTING ASPHALT ROADWAY
	PROPOSED GRAVEL ROADWAY

NOTE: ALL SYMBOLS MAY NOT BE USED IN THIS DRAWING



LOT 14
ADDRESS: 311 WAGON ROAD
0.69 Acres
PROPOSED SINGLE-FAMILY RESIDENCE
MAIN T.O. PLY = 9,824.25 = 11'-3"
T.O. BASEMENT SLAB = 9,813.0± = 0'-0"
GARAGE T.O.S. = 9,826 = 13'-0"
GARAGE T.O.S. = 9,825.25 = 12'-3"
ASPHALT DRIVEWAY
WAGON ROAD COUNTY ROAD No. 11 (50' R.O.W)
INDIANA CREEK ROAD
EDGE OF ASPHALT
PROPERTY LINE (P) N 79°09'34" E, 318.42' (M): N 79°18'14" E, 368.76'
PROPERTY LINE (P): S 78°41'10" W, 180.97' (M): S 78°40'33" W, 180.47'
SEPTIC TANKS: SEE SEPARATE OWTS DESIGN T.O.UPSTREAM TANK =9811.0 INLET = 9810.0
PROPOSED STA (REFER TO SEPERATE OWTS DESIGN DRAWINGS)
APPROXIMATE WETLAND BOUNDARY 25' SETBACK
ACTUAL WETLAND BOUNDARY SURVEY HAS NOT BEEN PERFORMED. THIS 25 FOOT SETBACK LINE IS BASED UPON A VISUAL SITE VISIT AND IS BELIEVED TO BE CONSERVATIVE
KEEP STA MIN. 25' FROM DELINEATED WETLANDS (FIELD VERIFY)
CONTRACTOR TO INSTALL BANK STABILIZATION FOR SLOPE AND TOE PROTECTION
SOIL PROFILE HOLE A
SOIL PROFILE HOLE B
SOIL PROFILE HOLE C
PROPOSED WELL (VARIANCE REQ'D FOR SETBACK TO STA)
EXISTING ELECTRIC GUY WIRE (IF DISTURBED, REPAIR AS REQ'D)
PHONE UTILITY POLE
END STATION 1+34.69 ELEV=9825.03
SURVEYORS CONTROL POINT
BOULDER STYLE RETAINING WALL
ROCK LINED SWALE
INTERSECTION WITH INDIAN CREEK ROAD
DRIVEWAY DESIGNED SLIGHTLY STEEPER THAN 10% (AND WITH RETAINING WALLS). ALL EFFORTS WERE MADE TO KEEP THE DRIVEWAY AT 10% MAX AND REDUCE THE FRONT RETAINING WALL HEIGHT; HOWEVER, THE NATURAL SITE GRADES, BEING OVER 30% IN MANY AREAS, AND THE HOUSE DESIGN DICTATED A STEEPER DRIVEWAY. A STEEPER DRIVEWAY DID REDUCE THE HOUSE HEIGHT. TOWN & FIRE DEPARTMENT APPROVAL IS REQUIRED
12" CMP, 35' L (FIELD VERIFY INLET & OUTLET). 6-12" ANGULAR ROCK AT INLET/OUTLET
POB STATION 0+00.0 ELEV=9833.50 (V.I.F.)
BENCHMARK: ELEV = 9833.0'. REFER TO SURVEYORS DRAWINGS
STATION 0+20.0 ELEV=9832.30 (GRADE CHANGE)
STATION 0+78.45 ELEV=9825.87 (GRADE CHANGE)
PT STATION 0+57.35 ELEV=9828.19
SLOPE BREAK: TOP OF EXISTING BANK
TOE OF EXISTING BANK
SALVAGE ALL TREES WHERE POSSIBLE, TYP.
APPROXIMATE 25 FOOT SETBACK FROM WETLAND BOUNDARY
TOP OF YELLOW CAP = 9801.05'
DO NOT DISTURB ANY WETLANDS
WATER LINE AT TIME OF SURVEY
STREAM BANK
TOP OF STREAM BANK
15' UTILITY AND PEDESTRIAN EASEMENT
25' BUILDING SETBACK
15' BUILDING SETBACK
10' UTILITY EASEMENT
SURVEYORS BENCHMARK: TOP OF YELLOW CAP = 9800.00'
PROTECT NEIGHBORING PROPERTY (DO NOT DRAIN ONTO NEIGHBORING PROPERTY)
NEIGHBORING LOT 13
EXISTING STA
151.25' TO PROPOSED WELL
SLOPE & BANK STABILIZATION IN THIS AREA MAY BE REQUIRED IN HIGH FLOOD EVENTS
PORCH & DECK
WINDOW SILL AT 9816.0 (VERIFY)
4BR GRAVEL STA

IN AREAS WHERE IT IS NOT POSSIBLE TO MAINTAIN A 1:1 CUT SLOPE, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL NECESSARY SHORING, BRACING, SLOPE STABILIZATION AND DRAINAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORKERS AS WELL AS MATERIALS AND WORKMANSHIP ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE DRAINAGE AND KEEPING THE SITE DE WATERED.

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Site & Grading Plan Detail

NOTE: 0'-0" ARCH = 9,813.00 USGS (VERIFY)

PLOTTED SCALE 1" = 10'

COLORADO REGISTERED PROFESSIONAL ENGINEER — J. LITTLEHORN — 04.10.2023

SITE & GRADING PLAN DETAIL

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB#1, LOT 14

LITTLEHORN ENGINEERING & SURVEYING
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 HIGHWAY 285, SUITE #201
FAIRPLAY, COLORADO 80440
MAIN OFFICE 719.836.7120
SILVER CLIFF PHONE 719.783.3757

PROJECT NO.
2022-100742

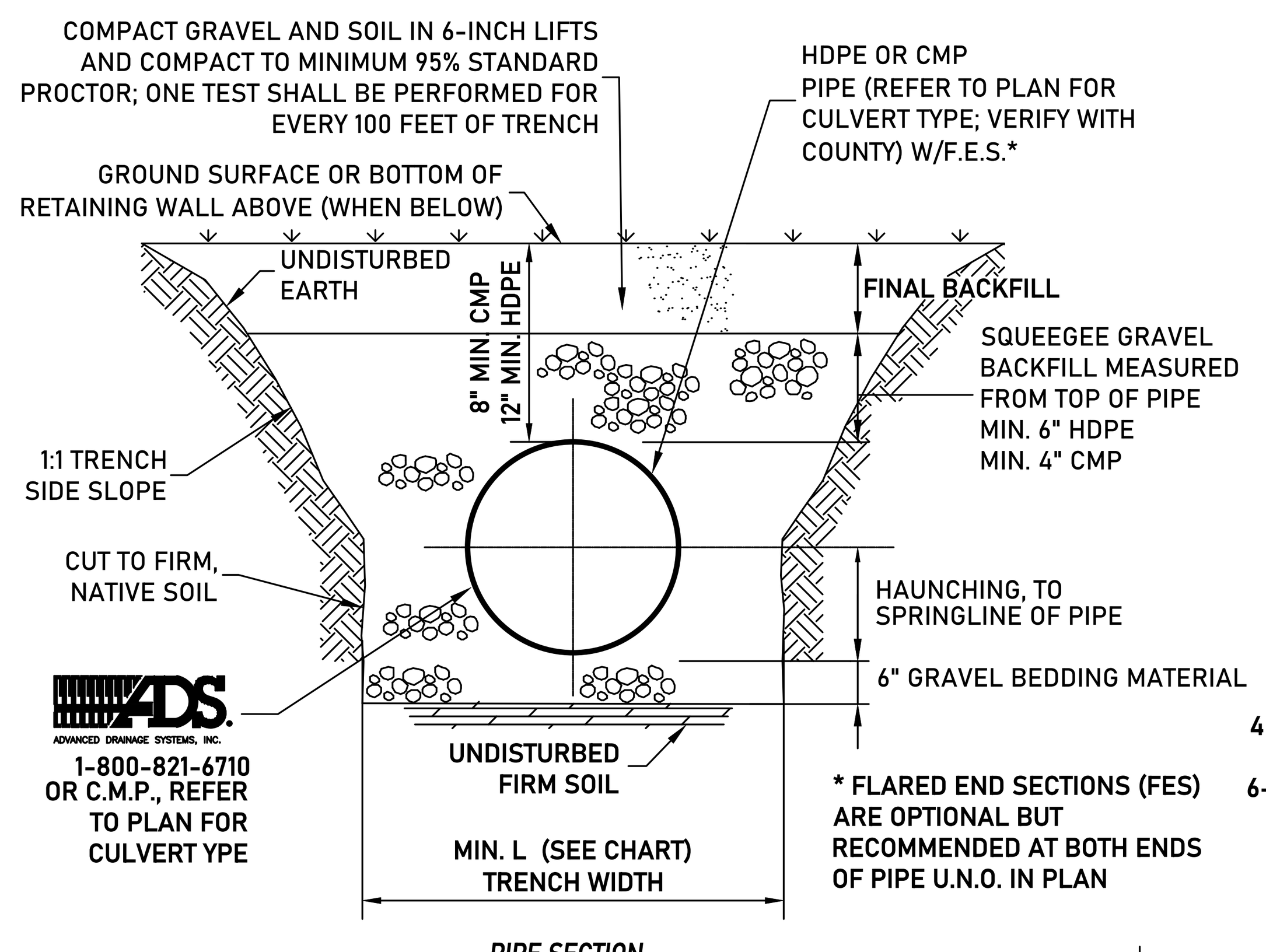
CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

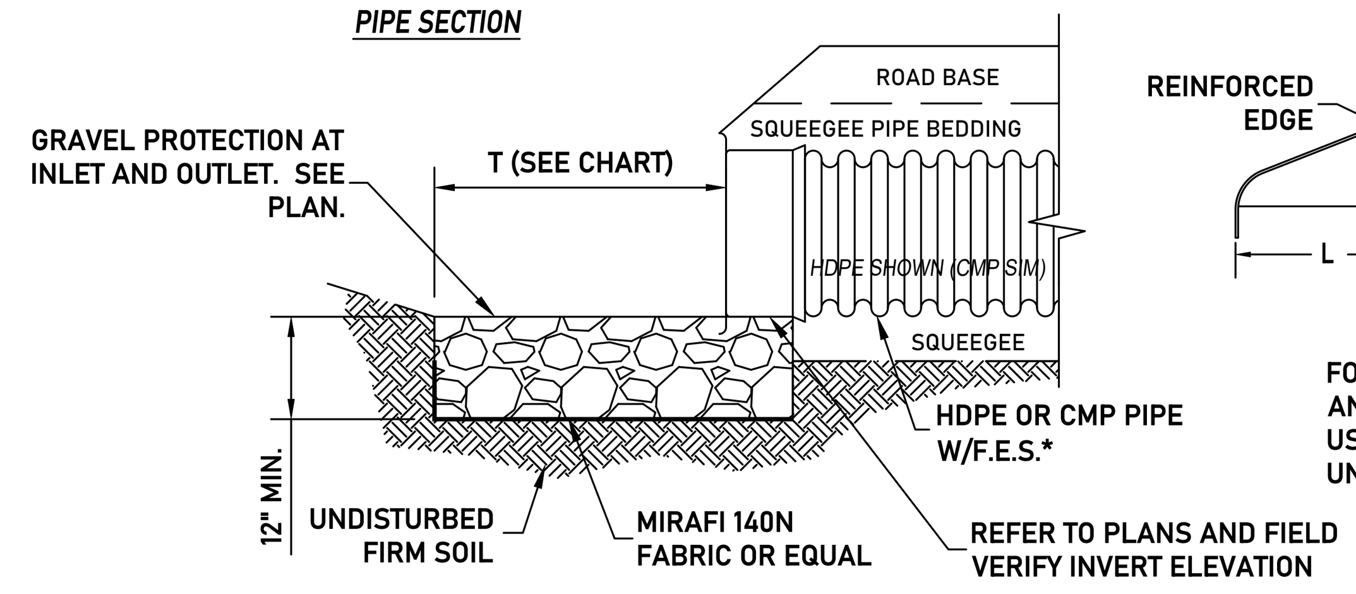
REVISION:
△ -
△ -

C1.1

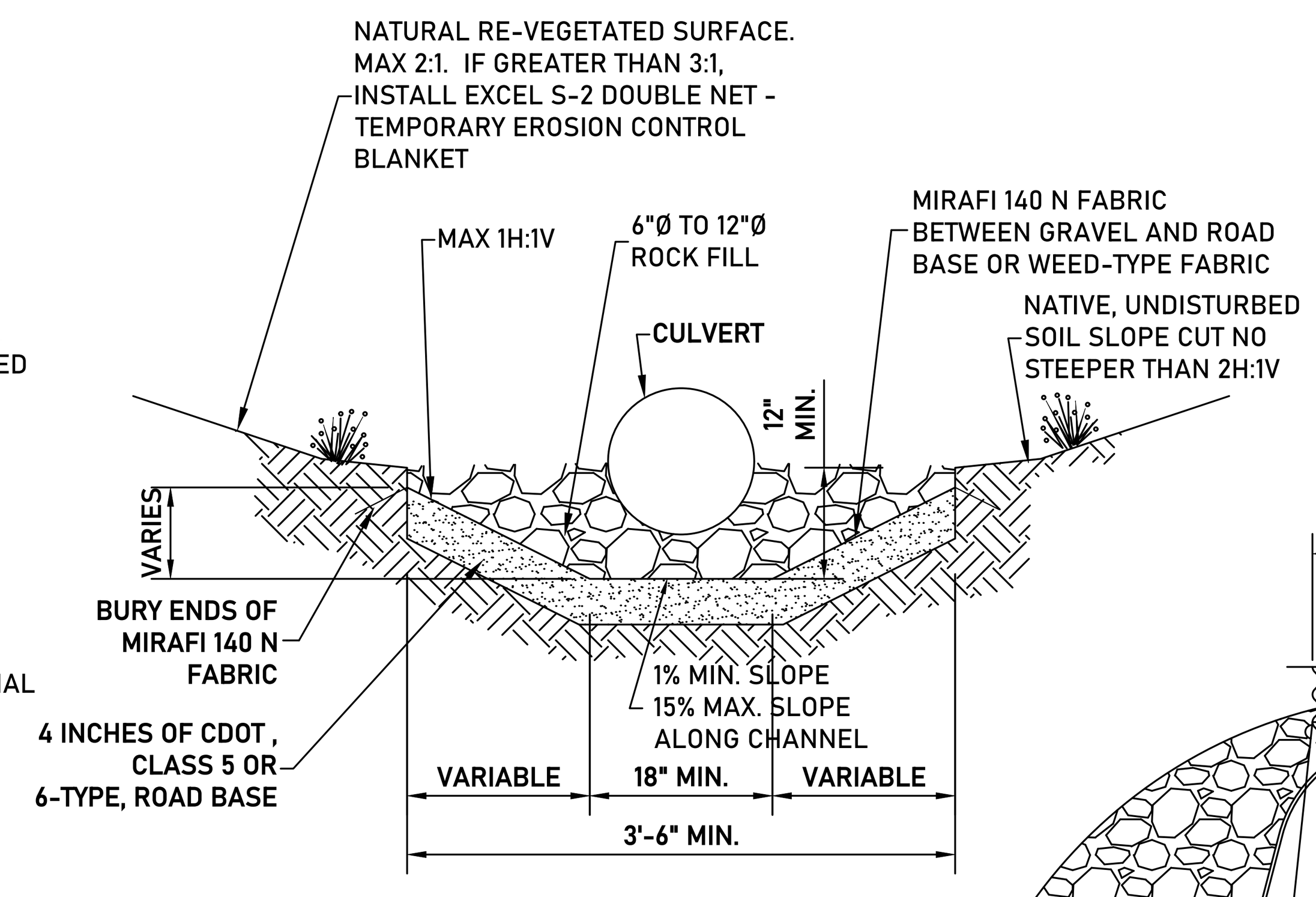
#5



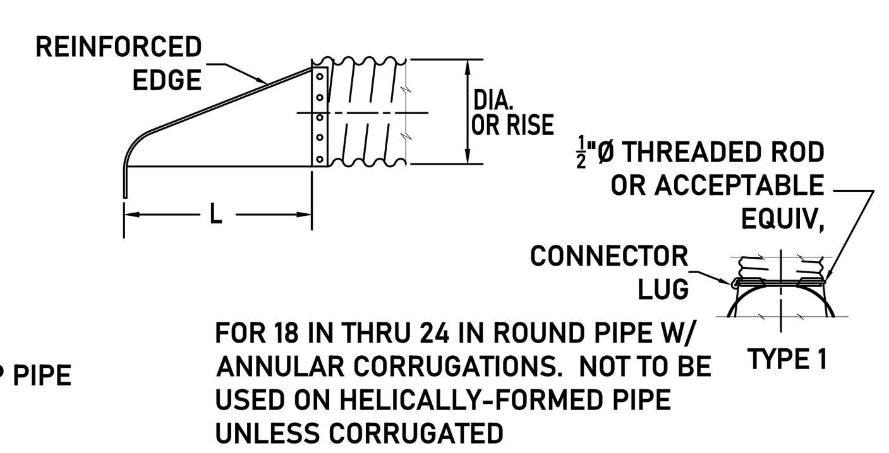
PIPE SECTION



SIDE VIEW



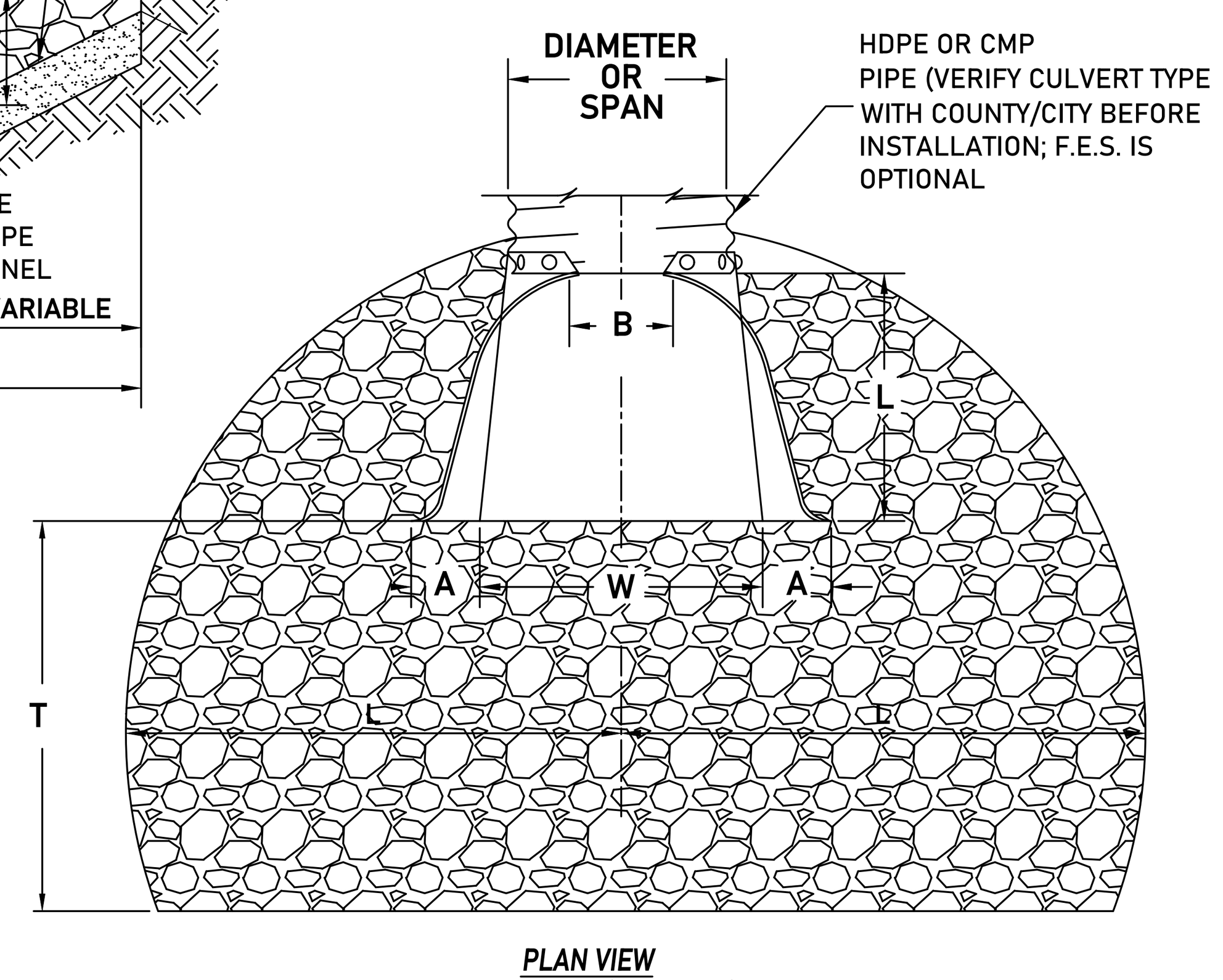
CULVERT OUTLET DETAIL



CMP FLARED END DETAIL

PIPE DIA.	THICKNESS	DIMENSIONS A	B	H	L	W	T
		(inches)					
12	0.064	6	6	6	21	24	60
18	0.064	8	10	6	31	36	60
21	0.064	9	12	6	36	42	60
24	0.064	10	13	6	41	48	72
30	0.079	12	16	8	51	60	96

THIN-WALL ROUND PIPE

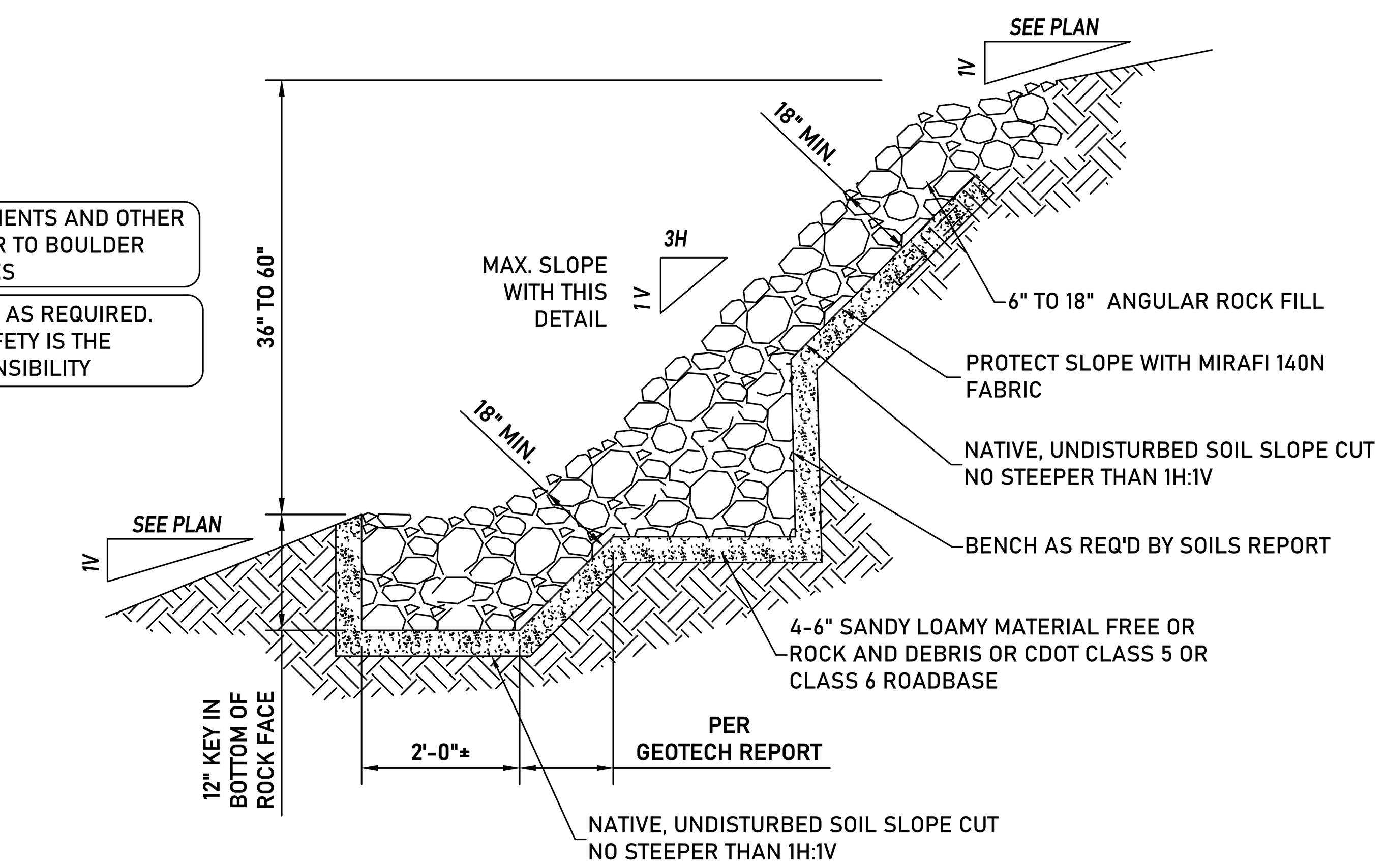


PLAN VIEW
CMP SHOWN (HDPE SIM)

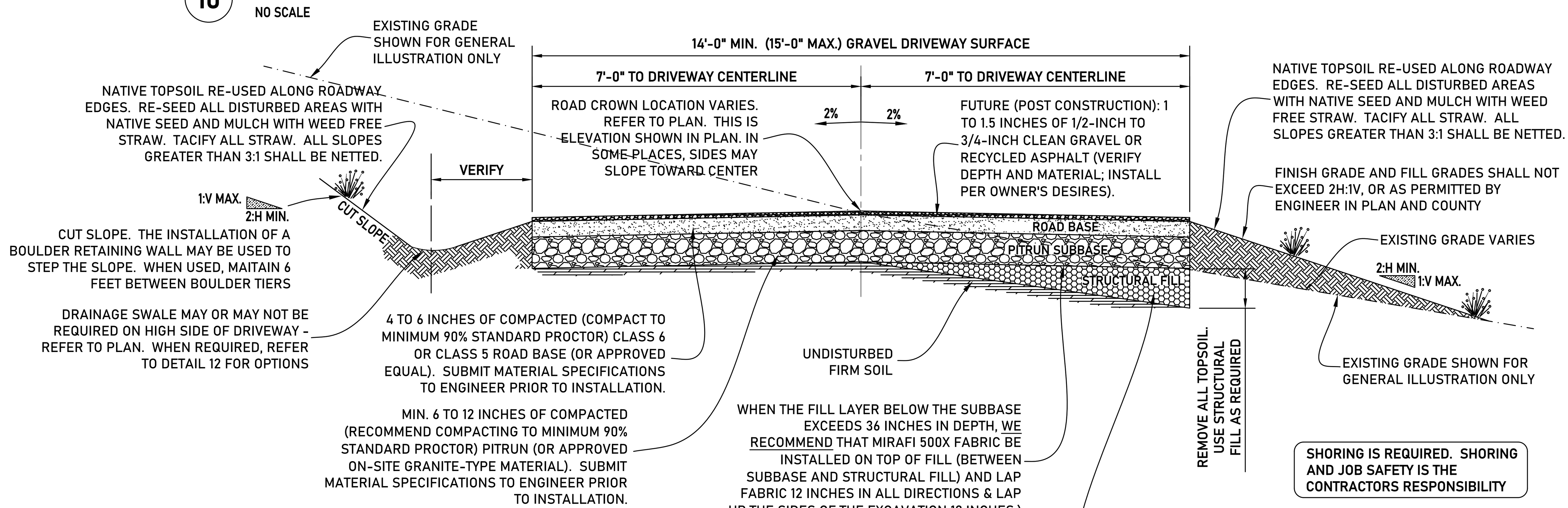
10 CULVERT DETAILS
NO SCALE

INSPECTION REQUIREMENTS AND OTHER REQUIREMENTS: REFER TO BOULDER RETAINING WALL NOTES

SHORE ALL TRENCHES AS REQUIRED. SHORING AND JOB SAFETY IS THE CONTRACTORS RESPONSIBILITY



13 SLOPE AND BANK STABILIZATION DETAIL
1/2"=1'-0"

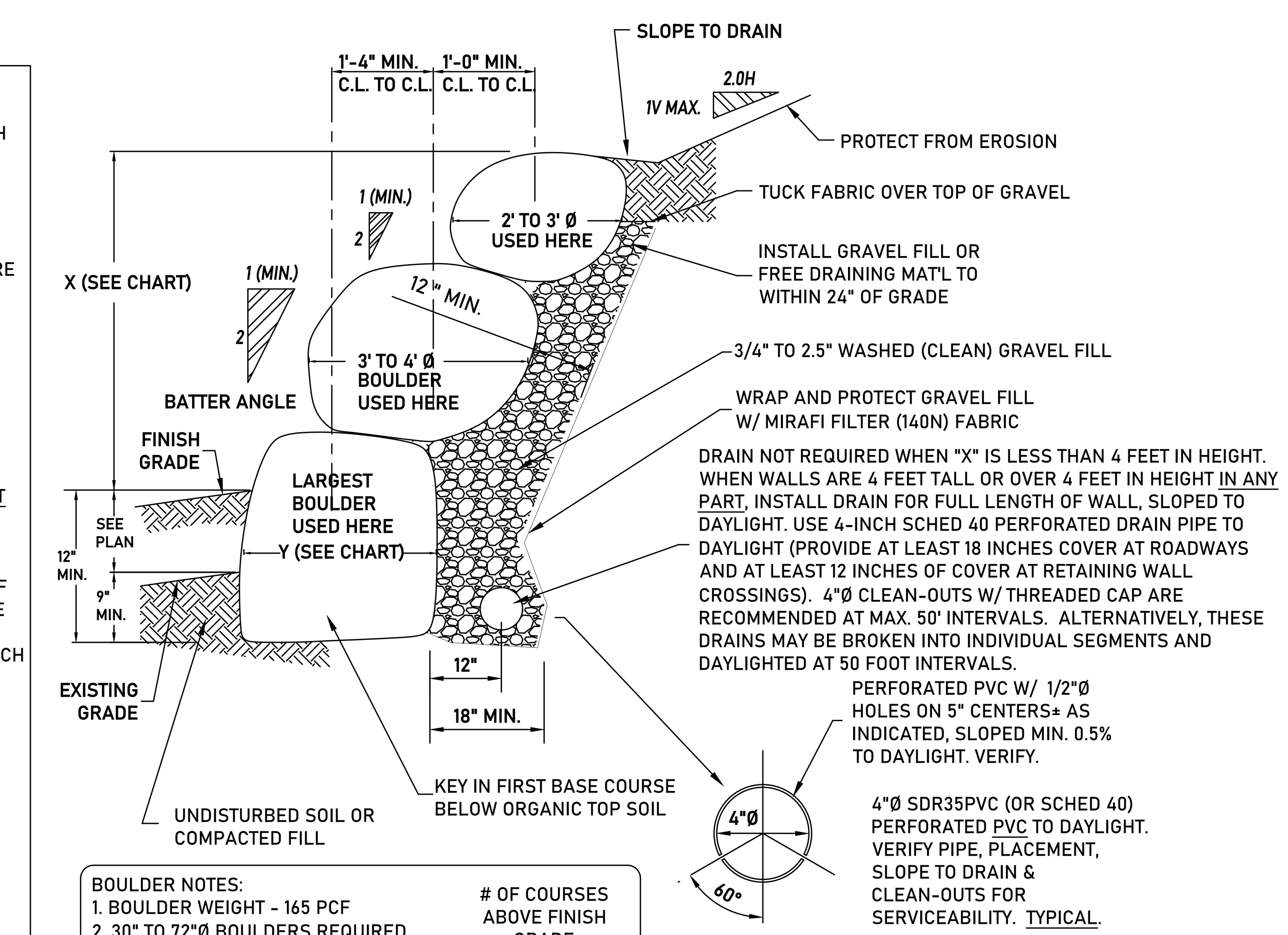


ALL TOPSOIL SHALL BE REMOVED PRIOR TO SUBBASE INSTALLATION. WHERE FILL IS REQUIRED BETWEEN THE NATIVE SOIL AND THE BOTTOM OF THE SUBBASE SHOWN, INSTALL APPROVED STRUCTURAL FILL (ON-SITE OR IMPORTED) IN 10-INCH MAX. LOOSE LIFTS AND COMPACT TO MINIMUM 95% STANDARD PROCTOR. STRUCTURAL FILL MAY CONSIST OF PITRUN, OR APPROVED ON-SITE SOILS WHICH DO NOT CONTAIN DEBRIS (STICKS, WOOD, GRASS, ICE, AND SNOW) OR ROCKS LARGER THAN 24 INCHES IN DIAMETER.

NOTES:
1. THIS SECTION ILLUSTRATES THE GENERAL DRIVEWAY/ROADWAY CONSTRUCTION AT VARIOUS SECTIONS. REFER TO THE SITE AND GRADING PLAN FOR CUT AND FILL LOCATIONS.
2. PARKING AREA NOTE: THE PROPOSED PARKING AREA IS TO BE CONSTRUCTED WITH SIMILAR OR EQUAL METHODS ILLUSTRATED IN THIS DIAGRAM

11 GENERIC DRIVEWAY SECTION
NO SCALE

NOTES:
1. REFER TO PLAN FOR WALL HEIGHTS AND LOCATIONS. HEIGHTS SHOWN IN THE PLANS INCLUDE THE WALL HEIGHT ABOVE FINISH GRADE AT THE FACE OF THE WALL AND DO NOT INCLUDE THE DEPTH OF THE WALL HEIGHT BELOW THE FINISH GRADE AT THE TOE.
2. DO NOT EXCEED THE HEIGHTS SHOWN IN THIS DETAIL FOR ANY REASON. CALL ENGINEER IF THERE ARE DISCREPANCIES BEFORE INSTALLATION.
3. PLACE BOULDERS SO THEY INTERLOCK BOTH VERTICALLY AND HORIZONTALLY. BACKFILL SOIL AND BASE SOIL INSTALLATION AND COMPACTION SHALL BE VERIFIED BY THE SOILS ENGINEER DURING CONSTRUCTION OF WALL.
4. WALLS ARE DESIGNED WITHOUT SEISMIC ANALYSIS.
5. THIS WALL DETAIL IS NOT PERMITTED TO BE USED WITHIN 25 FEET OF AN SOIL TREATMENT AREA.
6. CALL ENGINEER DURING AND AFTER INSTALLATION OF ALL BOULDER WALLS. ENGINEERING INSPECTION AND APPROVAL OF WALL DRAINS, BOULDERS, GRAVEL BACKFILL, AND GRADES ARE REQUIRED BY THE ENGINEER. USUALLY TWO TO FOUR INSPECTIONS ARE REQUIRED DURING THE CONSTRUCTION OF EACH WALL. A FINAL INSPECTION IS ALSO REQUIRED AFTER WALL CONSTRUCTION AND REVEG.
7. WHEN BUILDING BOULDER WALLS, KEY IN THE BASE BELOW ANY EXISTING TOPSOIL, USE APPROXIMATELY SIZED BOULDERS, AND INSTALL TO BATTER ANGLE (TAPER) SHOWN.
8. THE BASE OF THE BOULDER WALL SHALL BEAR ON UNDITURBED SOIL FREE OF ORGANIC MATERIAL, SOFT OR WET SOILS, DEBRIS, ICE, OR SNOW.
9. THIS WALL REQUIRES ROUTINE MAINTENANCE AND IS NOT THE BEST WALL TO CONSTRUCT WITH. THIS DETAIL IS PROVIDED AS A COURTESY TO THE CLIENT. A BETTER RETAINING WALL IS A WALL SIMILAR TO REDI-ROCK. THESE RETAINING WALLS ARE STRONGER AND LAST LONGER AND ARE STRONGLY RECOMMENDED BUT MORE EXPENSIVE TO CONSTRUCT. THESE BOULDER WALLS ARE NOT DESIGNED TO RESIST EARTHQUAKE-TYPE LOADS.
10. CONTACT ENGINEER FOR ANY QUESTIONS.



BOULDER NOTES:
1. BOULDER WEIGHT - 165 PCF
2. 30" TO 72"Ø BOULDERS REQUIRED
3. UNDERLYING SOILS ARE ASSUMED TO PROVIDE 2500 PSF.

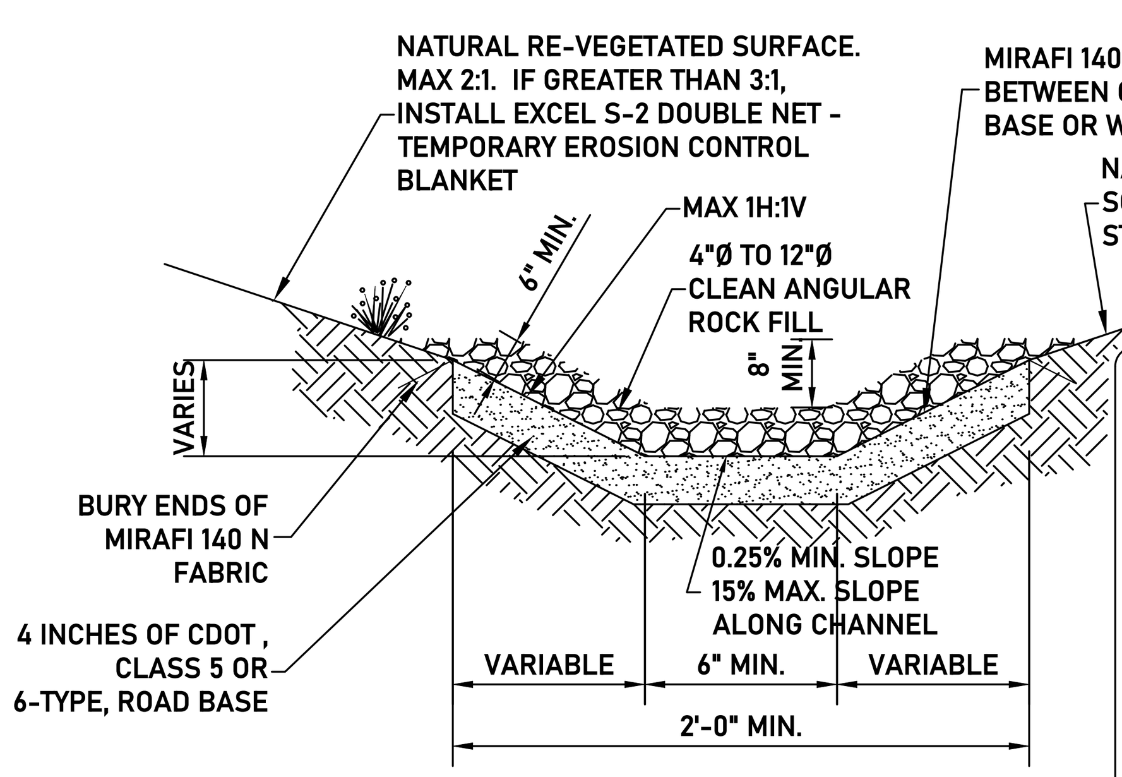
OF COURSES ABOVE FINISH GRADE

X IN FEET	Y IN FEET	BASE COURSE	BOULDER COURSES
<5 FEET	3-4 FEET	1 BOULDER	1-2 BOULDERS
5-9 FEET	4-5 FEET	1 BOULDER	2-3 BOULDERS
-	-	-	-

TOTAL # OF COURSES MAY BE MORE TO ENSURE BOULDER IS KEYED IN BELOW TOPSOIL

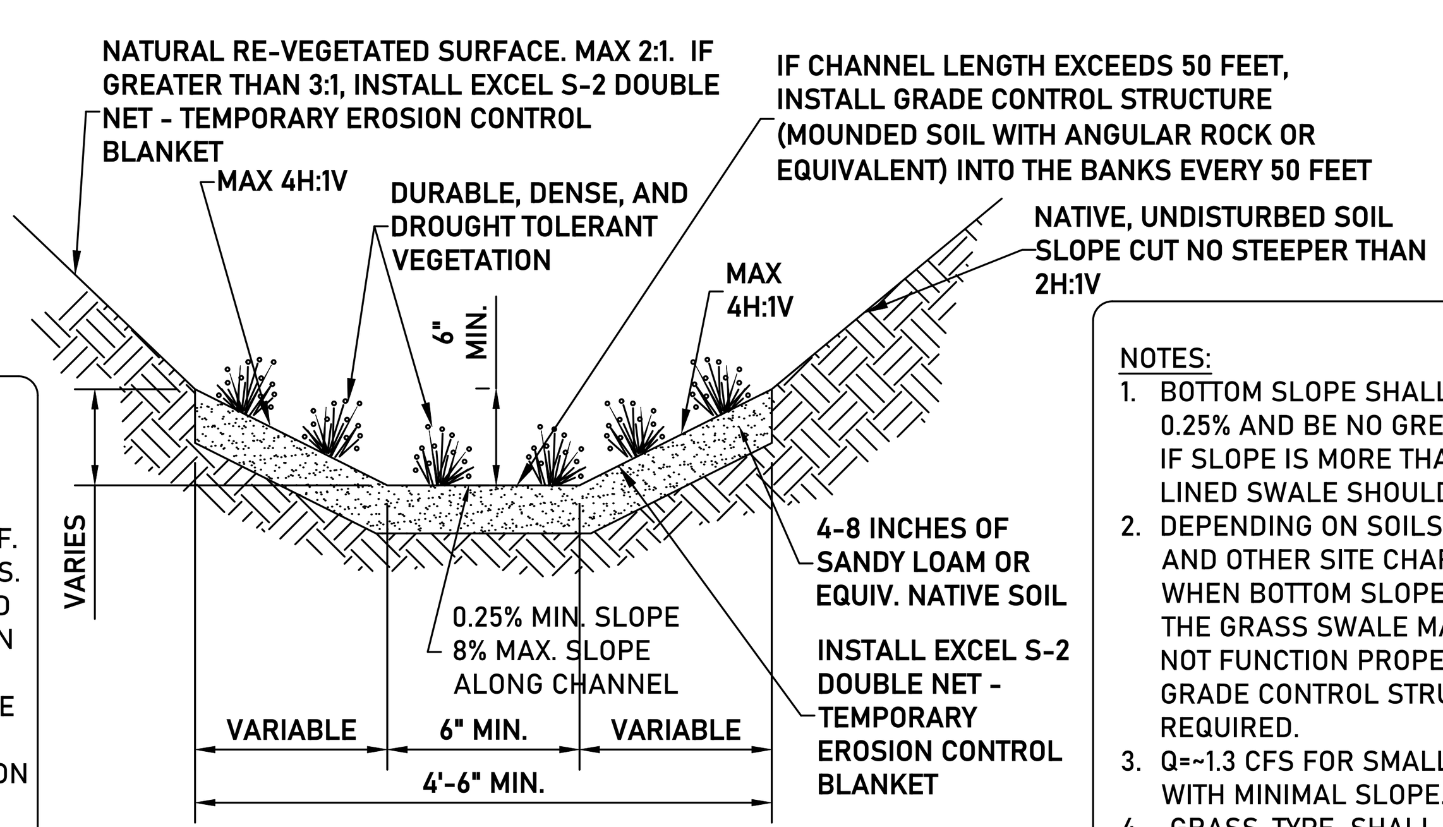
SHORING IS REQUIRED. SHORING AND JOB SAFETY IS THE CONTRACTORS RESPONSIBILITY

14 --
1/2"=1'-0"



ROCK SWALE SECTION

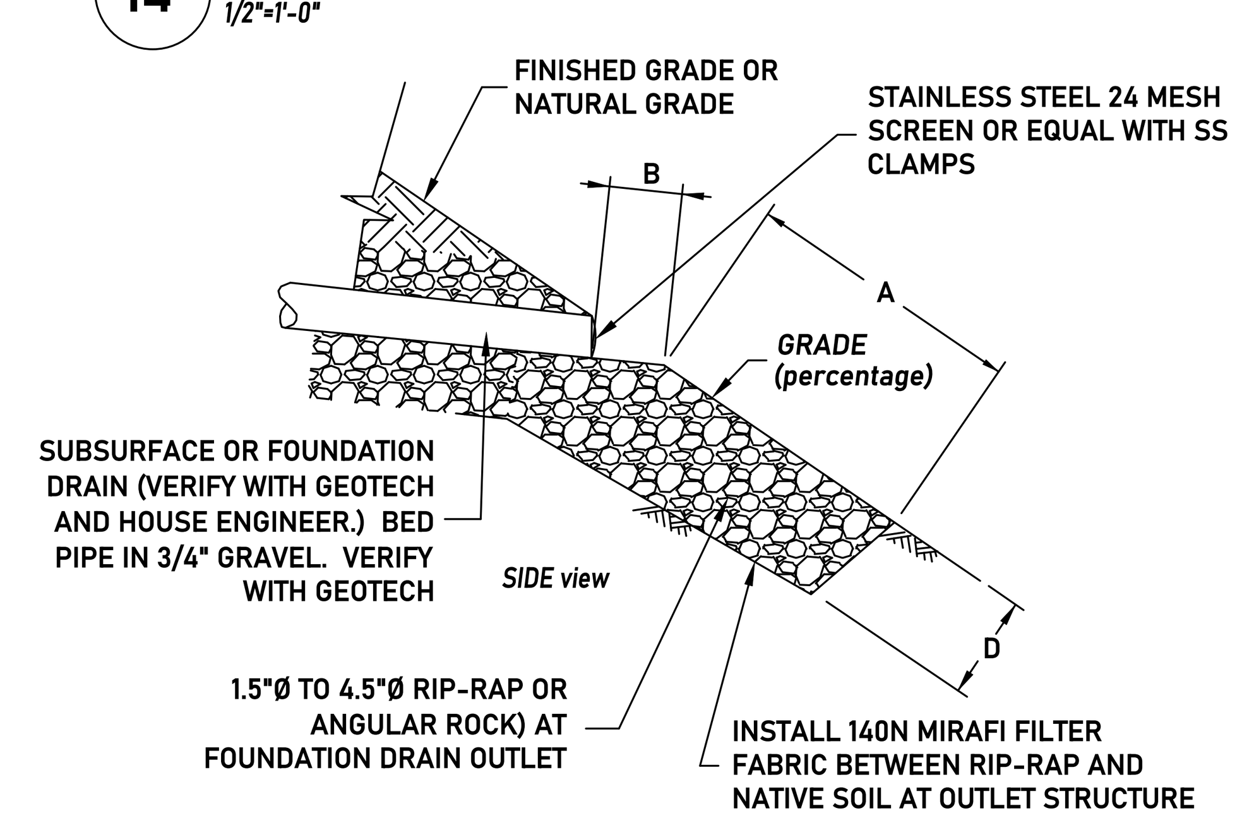
NOTES:
1. ROCK WEIGHT - 150 PCF
2. USE TYPE OF ROCK SPECIFIED
3. UNDERLYING SOILS ARE ASSUMED TO PROVIDE 2750 PSF.
4. REFER TO PLAN FOR LOCATIONS. THIS DETAIL MAY BE PERMITTED IN LOCATIONS NOT SPECIFIED IN PLAN BUT APPROVAL FROM ENGINEER IS REQUIRED BEFORE INSTALLATION.
5. CALL ENGINEER FOR INSPECTION DURING AND AFTER INSTALLATION.



GRASS SWALE SECTION

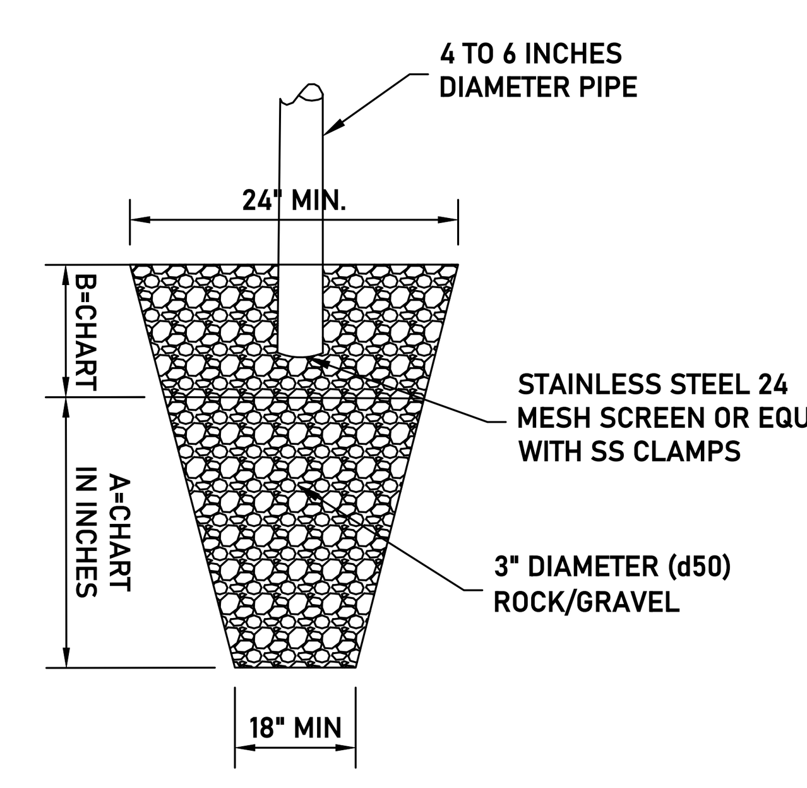
NOTES:
1. BOTTOM SLOPE SHALL DRAIN MIN. 0.25% AND BE NO GREATER THAN 8%. IF SLOPE IS MORE THAN 8%, A ROCK LINED SWALE SHOULD BE USED.
2. DEPENDING ON SOILS, SITE GRADING, AND OTHER SITE CHARACTERISTICS, WHEN BOTTOM SLOPE EXCEEDS 4%, THE GRASS SWALE MAY ERODE AND NOT FUNCTION PROPERLY. USE GRADE CONTROL STRUCTURES AS REQUIRED.
3. Q=1.3 CFS FOR SMALLEST CHANNEL WITH MINIMAL SLOPE.
4. GRASS-TYPE SHALL MEET COUNTY SPECIFICATIONS

12 ROCK LINED AND GRASS-TYPE LANDSCAPE SWALE OPTIONS
NO SCALE



SITE GRADE (percentage)	DIMENSIONS (inches) A	B	D
0-5%	30	6	12
5%-10%	42	8	12
10%-15%	48	10	12
15%-20%	60	12	8
20%-30%	72	14	8
30%-50%	84	16	8
50%-80%	96	18	8
>80%	CONTACT ENGINEER		

NOTE: THE LOCATION OF THIS OUTLET MUST BE AWAY FROM THE STA, SEPTIC TANK AND WELL AND MUST DAYLIGHT ON THE SUBJECT PROPERTY. DRAIN SHALL NOT CREATE A WATER PROBLEM FOR ANY NEIGHBORING PROPERTY



15 TYPICAL DRAIN DAYLIGHT DETAIL
NO SCALE

COLORADO REGISTERED PROFESSIONAL ENGINEER 04.10.2023

SITE CONSTRUCTION DETAILS

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB#1, LOT 14

LITTLEHORN ENGINEERING & SURVEYING
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 HIGHWAY 285, SUITE #201
FAIRPLAY, COLORADO 80440
MAIN OFFICE 719.836.7120
SILVER CLIFF PHONE 719.783.3757

PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
△ -
△ -

C2

#6

POST-CONSTRUCTION: INSTALL STRAW WATTLE (43/C4)

PRE-CONSTRUCTION: INSTALL SILT FENCING INSIDE PROPERTY BOUNDARY (42/C4)

POST-CONSTRUCTION: INSTALL STRAW WATTLE (43/C4)

WAGON ROAD
COUNTY ROAD No. 11
(50' R.O.W)

EDGE OF ASPHALT

PRE-CONSTRUCTION, INSTALL SILT FENCING TO PROTECT WETLANDS (DO NOT DISTURB WETLANDS) (42/C4)

LOT 14
ADDRESS: 311 WAGON ROAD
0.69 Acres

POST-CONSTRUCTION, INSTALL STRAW WATTLE (43/C4)

GARAGE T.O.S. = 9,825.25 = 12'-3"

ASPHALT DRIVEWAY

PORCH & LANDSCAPE

MAIN T.O. PLY = 9,824.25 = 11'-3"

GARAGE T.O.S = 9,826 - 13'-0"

PROPOSED SINGLE-FAMILY RESIDENCE

T.O. BASEMENT SLAB = 9,813.0± = 0'-0"

WAGON ROAD
COUNTY ROAD No. 11
(50' R.O.W)

PRE-CONSTRUCTION: INSTALL SILT FENCING TO PROTECT WETLANDS (DO NOT DISTURB WETLANDS) (42/C4)

POST-CONSTRUCTION: INSTALL STRAW WATTLE (43/C4)

POST-CONSTRUCTION: INSTALL STRAW WATTLE (43/C4)

PRECONSTRUCTION: INSTALL SILT FENCING INSIDE PROPERTY BOUNDARY (42/C4)

CULVERT INLET PROTECTION (41/C4)

IN AREAS WHERE IT IS NOT POSSIBLE TO MAINTAIN A 1:1 CUT SLOPE, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL NECESSARY SHORING, BRACING, SLOPE STABILIZATION AND DRAINAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORKERS AS WELL AS MATERIALS AND WORKMANSHIP ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE DRAINAGE AND KEEPING THE SITE DEWATERED.

ALL DISTURBED AREAS TO BE REVEGETATED WITH NATIVE WEED-FREE GRASS SEED. SLOPES OF 3:1 OR GREATER SHALL BE NETTED AFTER THEY HAVE BEEN SEEDED. CONTRACTOR & OWNER IS RESPONSIBLE FOR EROSION CONTROL MONITORING, MAINTENANCE, AND FOR ENSURING THAT THE EROSION CONTROL METHODS PRESENTED ARE OPERATIONAL AND FUNCTION PROPERLY. TYPICAL ALL AREAS.

Erosion Control Plan

0' 10' 20' 30'
PLOTTED SCALE 1" = 10'

COLORADO REGISTERED JOHN J. LITTLEHORN PROFESSIONAL ENGINEER 04.10.2023

EROSION CONTROL PLAN

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB#1, LOT 14

LITTLEHORN ENGINEERING & SURVEYING
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 HIGHWAY 285, SUITE #201
FAIRPLAY, COLORADO 80440
MAIN OFFICE 719.836.7120
SILVER CLIFF PHONE 719.783.3757

PROJECT NO.
2022-100742

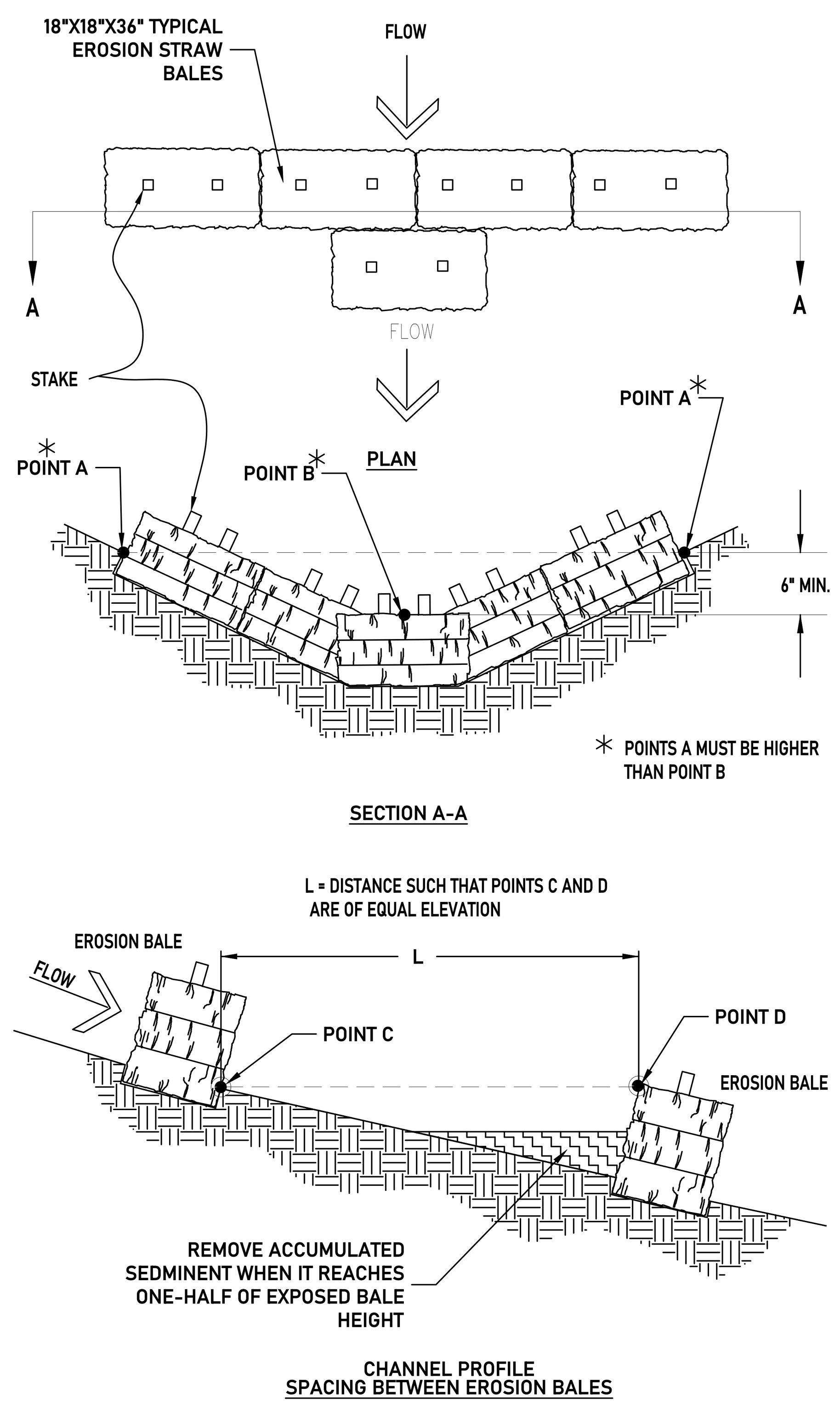
CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 -
2 -

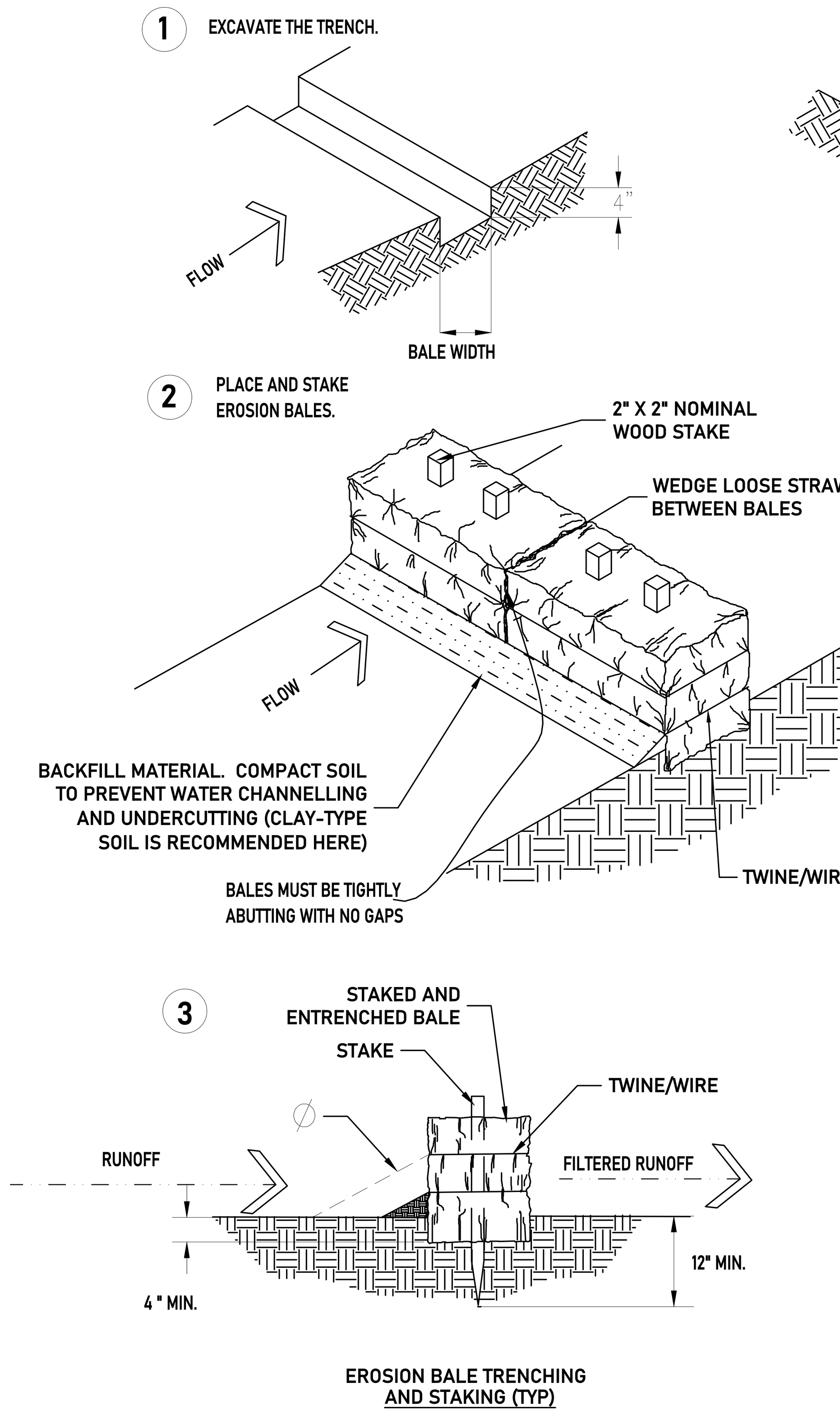
C3

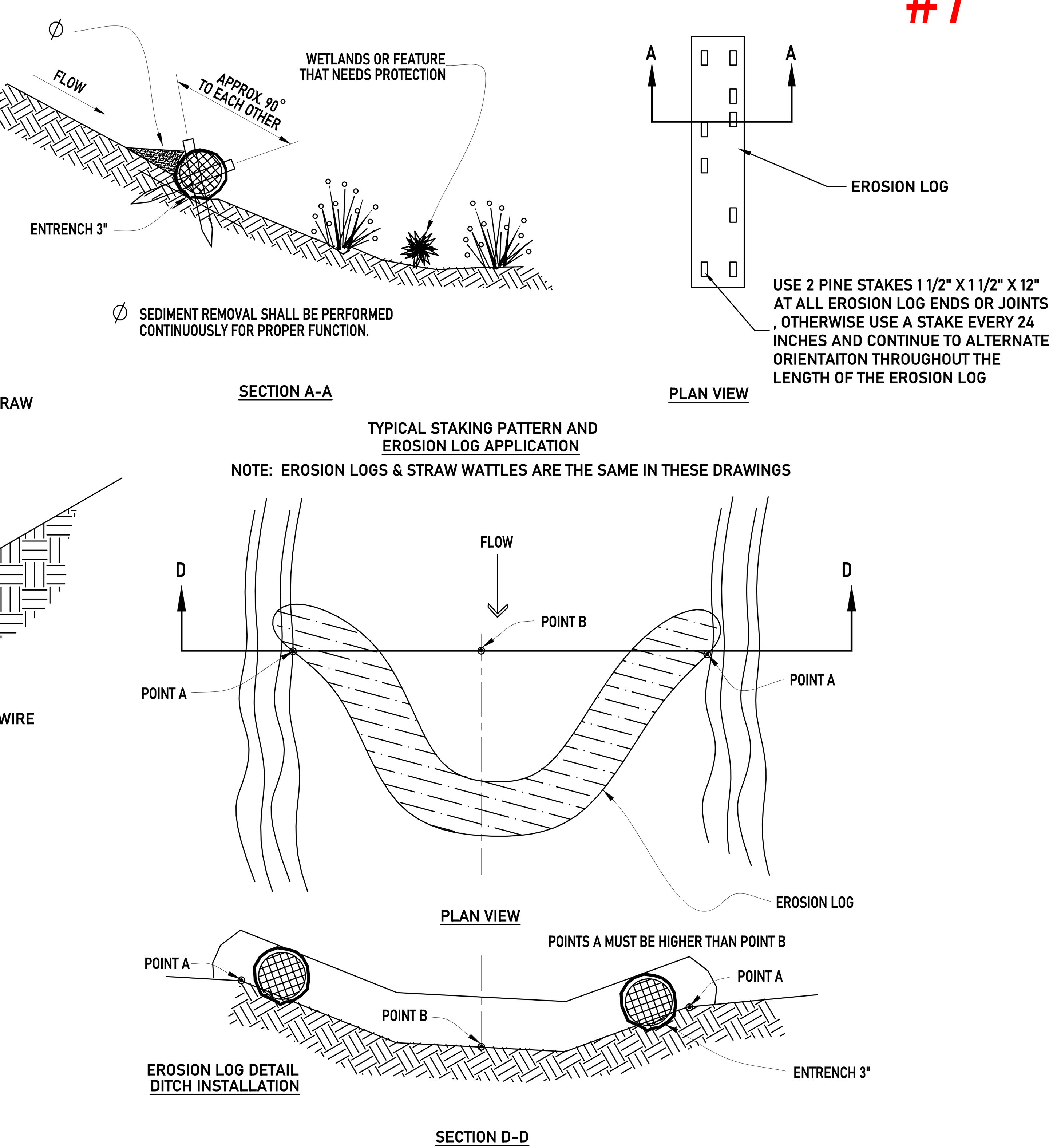
#7



NOTE: A STRAW BALE BARRIER CONSISTS OF STRAW BALES PLACED END TO END ALONG A LEVEL CONTOUR IN A SHALLOW TRENCH AND THEN STAKED TO HOLD THEM IN PLACE. THE STRAW BALE BARRIER DETAINS AND FILTERS STORMWATER RUNOFF, CREATING A SMALL POND BEHIND THE BARRIER WHERE SEDIMENTATION OCCURS. STRAW BALE BARRIERS CAN BE INSTALLED BELOW SLOPES, ALONG PAVED AREAS, ALONG STREAM BANKS AND MANY OTHER LOCATIONS WITHOUT REQUIRING VEHICLE ACCESS OR HEAVY EQUIPMENT. STRAW BALE BARRIERS CAN BE INSTALLED BY HAND OR BY USING A SMALL PIECE OF TRENCHING EQUIPMENT (PROVIDED THE AREA IS OUTSIDE A WETLAND AREA). PROPER INSTALLATION IS NECESSARY TO ENSURE GOOD EROSION CONTROL. IMPROPERLY INSTALLED STRAW BALE BARRIERS CAN ACTUALLY WORSEN EROSION BY CONCENTRATING STORMWATER RUNOFF INSTEAD OF SLOWING AND DETAINING. STRAW BALE BARRIERS ARE OFTEN USED INTERCHANGEABLY WITH SILT FENCE. HOWEVER, SILT FENCE HAS A MUCH HIGHER EFFICIENCY IN REDUCING SEDIMENT, WILL LAST LONGER, AND MAY BE MORE COSTEFFECTIVE. A STRAW BALE BARRIER TYPICALLY HAS A MAXIMUM LIFE OF 3 MONTHS PRIOR TO EXCESSIVE DETERIORATION AND ROT. STRAW BALE BARRIERS ARE OFTEN USED IN TWO ROWS OF BALES, OR WITH A LAYER OF GEOTEXTILE FABRIC ACROSS THE FRONT, OR IN CONJUNCTION WITH OTHER EROSION CONTROL DEVICES, IN ORDER TO IMPROVE THE SEDIMENT REMOVAL CAPABILITIES OF STRAW BALES. A SINGLE ROW OF STRAW BALE BARRIER MAY REMOVE APPROXIMATELY 60% OF THE SEDIMENT IF CAREFULLY INSTALLED AND MAINTAINED. EFFICIENCY IS MAINTAINED PRIMARILY BY REPLACING STRAW BALES WHICH HAVE DETERIORATED IN A TIMELY MANNER. SUITABLE APPLICATIONS INCLUDE THE FOLLOWING:

1. ALONG THE PERIMETER OF THE SITE EXCEPT DO NOT USE WITHIN A ROADWAY R.O.W.
2. ALONG STREAMS AND CHANNELS, OR TO PROTECT SENSITIVE AREAS.
3. AROUND TEMPORARY SPOIL AREAS AND OTHER SMALL CLEARED AREAS.
4. AT THE BOTTOM OF EXPOSED AND SIGNIFICANT ERODIBLE SLOPES.
5. WITHIN A SWALE OR DITCH THAT HAS GENTLE SLOPES AND DRAINAGE AREA LESS THAN 1 ACRE.

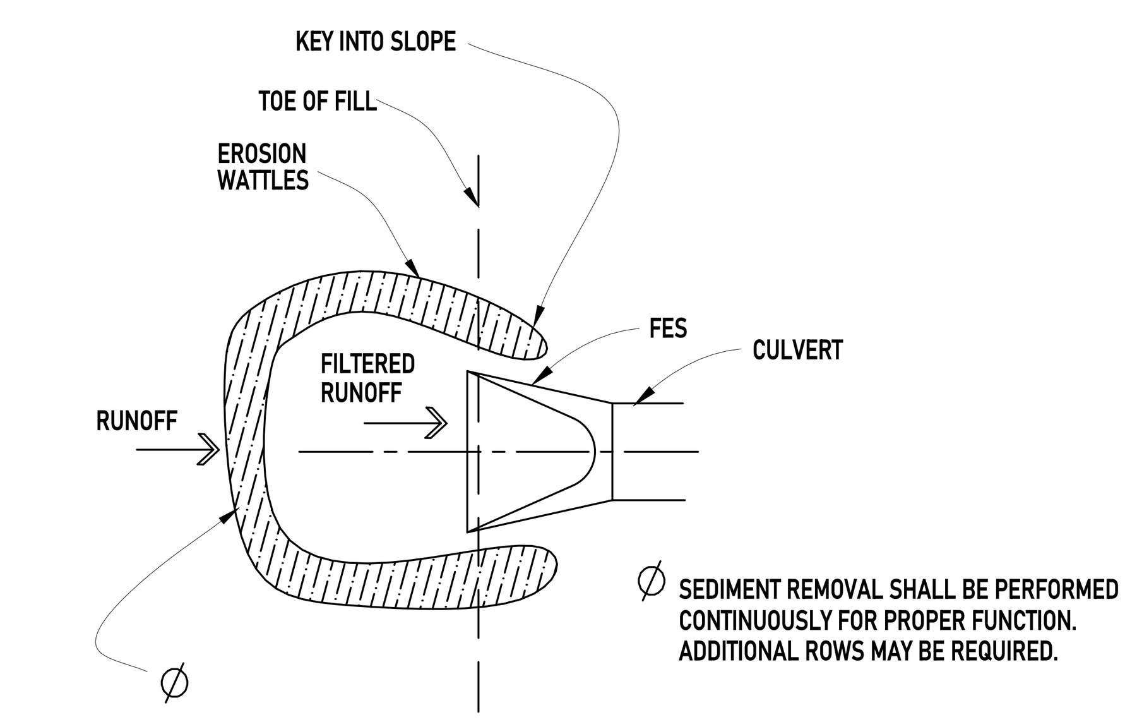




40 STRAW BALE DETAILS

43 EROSION LOG DETAILS

ALL DISTURBED AREAS TO BE REVEGETATED WITH NATIVE WEED-FREE GRASS SEED. SLOPES OF 3:1 OR GREATER SHALL BE NETTED AFTER THEY HAVE BEEN SEEDED. CONTRACTOR & OWNER IS RESPONSIBLE FOR EROSION CONTROL MONITORING, MAINTENANCE, AND FOR ENSURING THAT THE EROSION CONTROL METHODS PRESENTED ARE OPERATIONAL AND FUNCTION PROPERLY. TYPICAL ALL AREAS.

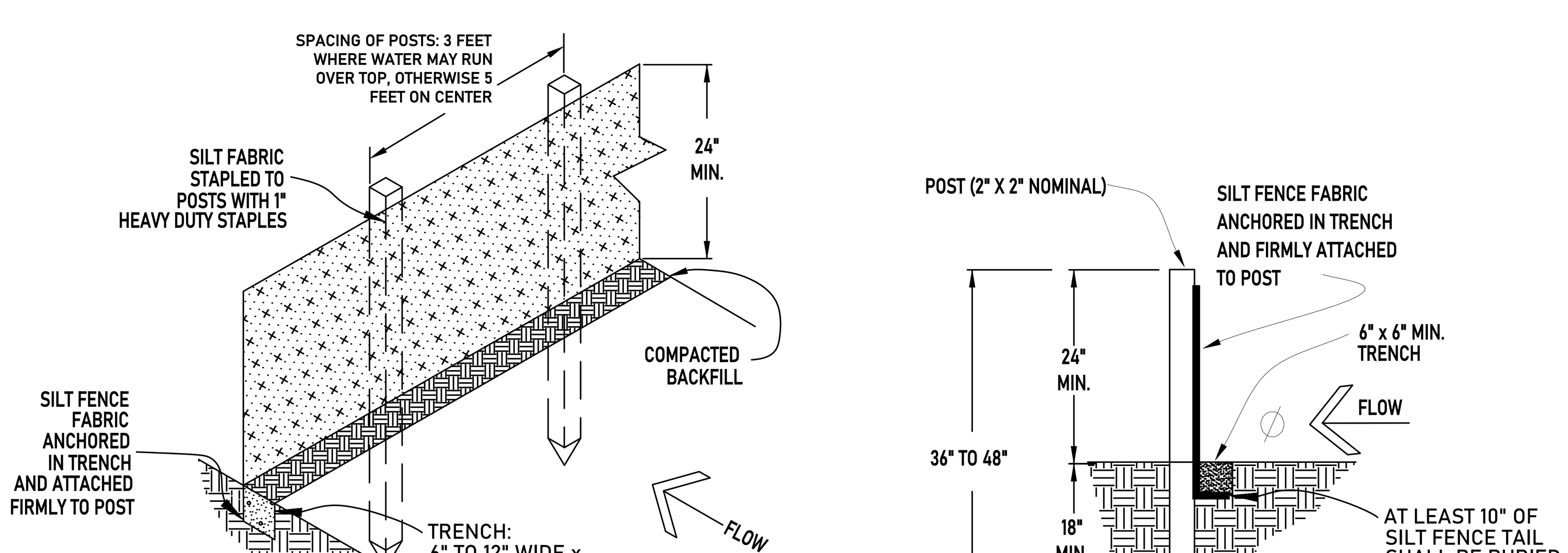


41 CULVERT INLET PROTECTION

OUTLET PROTECTION IS SIMILAR EXCEPT USE TWO ROWS - APPROX. 3-5 FEET APART.

THIS STRAW WATTLE IS TO BE INSTALLED AFTER THE CULVERT IS INSTALLED

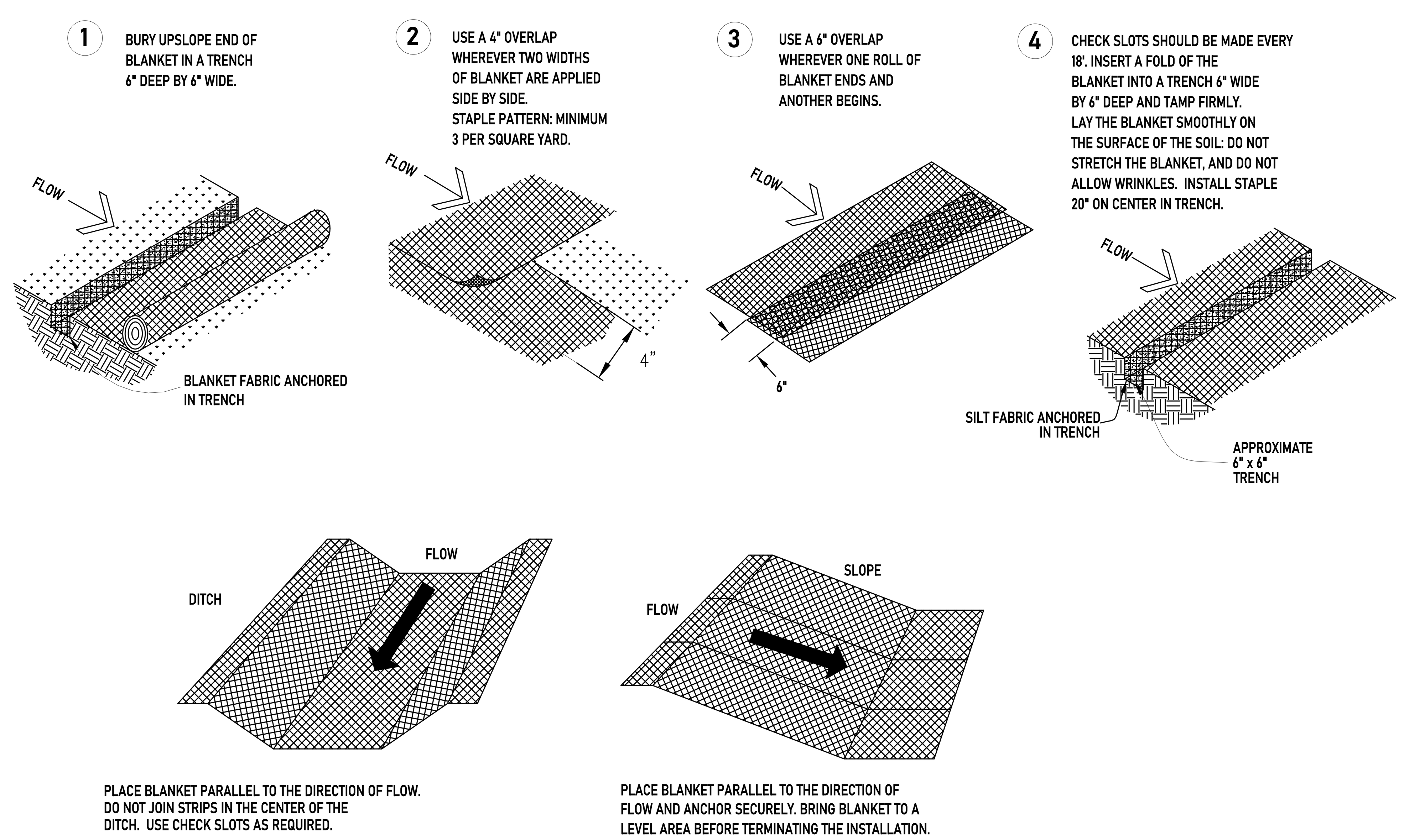
ONE (1) YEAR AFTER PROJECT COMPLETION (WHEN THE CERTIFICATE OF OCCUPANCY IS OBTAINED AND DELIVERED TO THE HOME OWNER), THE CONTRACTOR SHALL VISIT THE SITE AND PERFORM ROUTINE MAINTENANCE REQUIREMENTS AND ASSUMING THE RE-VEGETATION PROCESS IS COMPLETE, ALL TEMPORARY EROSION PRODUCTS (SEE ITEM 4 ON THIS SHEET) CAN BE REMOVED



1. SILT FENCE MAY BE SUBSTITUTED IN LIEU OF STRAW WATTLES.
2. WHERE SILT FENCING IS SPECIFIED IN THE PLAN, STRAW WATTLES MAY NOT BE SUBSTITUTED.
3. WHERE JOINTS IN SILT FENCE ARE REQUIRED, POSTS SHALL BE JOINED TOGETHER, THEN ROTATED 180 DEGREES AND DRIVEN INTO THE GROUND POSTS SHALL OVERLAP AT JOINTS SUCH THAT NO GAPS IN FENCING EXIST.
4. CREATE J-HOOKS AT ENDS OF SILT FENCE.

SEDIMENT REMOVAL SHALL BE PERFORMED CONTINUOUSLY FOR PROPER FUNCTION.

42 SILT FENCE DETAIL



SLOPES GREATER THAN 3:1, INSTALL EXCEL S-2 DOUBLE NET, TEMPORARY EROSION CONTROL BLANKET

44 SOIL RETENTION BLANKETS

EROSION CONTROL:

1. THE CONTRACTOR AND OWNER SHALL PROVIDE ALL SUPERVISION, LABOR, MATERIALS, TOOLS, EQUIPMENT AND RELATED ITEMS REQUIRED FOR PREPARING GROUND, PROVIDING FOR SOWING OF SEEDS AND FERTILIZING, MULCHING WITH STRAW, WATERING WEED CONTROL, AND OTHER MANAGEMENT PRACTICES REQUIRED FOR EROSION CONTROL AND TO OBTAIN A GRASS COVER. AREAS REQUIRING SEEDING FOR EROSION CONTROL WILL INCLUDE THE LEVEE AND ROADWAY EMBANKMENT, DRAINAGE DITCHES, OUTFALL CHANNEL, ALL BORROW AREAS, AND ALL AREAS DISTURBED BY CONSTRUCTION, INCLUDING THE WORKING EASEMENT.

2. SEEDING. SEED SHALL COMPLY WITH U.S. DEPARTMENT OF AGRICULTURE RULES AND REGULATIONS UNDER THE FEDERAL SEED ACT. BAGS OF FERTILIZER SHALL BE FULLY LABELED COMPLYING WITH APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME, TRADEMARK, AND WARRANTY OF PRODUCER. CONTRACTOR SHALL INSPECT AND MAKE SURE THAT ALL WORK IS IN COMPLIANCE AS REQUIRED WITH REGARD TO THE SEED BED PREPARATION, FERTILIZER APPLICATION RATE, PLANTING SEED RATE, PLANTING SEED UNIFORMITY, AND APPLICATION OF MULCH.

3. HYDRO SEEDING MULCH. HYDRO SEEDING MULCH FIBER (IF USED) SHALL BE PRODUCED FROM A NATURAL OR RECYCLED STRAW FIBER; THESE MATERIALS SHOULD BE FREE FROM PLASTIC MATERIALS OR OTHER NON BIO-DEGRADABLE SUBSTANCES. FIBER SHALL BE OF SUCH CHARACTER THAT THE FIBER WILL DISPERSE INTO UNIFORM SLURRY WHEN MIXED WITH WATER. IT IS IMPERATIVE THAT THE MULCH BE APPLIED AT THE SPECIFIED RATE; TOO WET OF A MIXTURE WILL CAUSE THE FIBERS TO BE BURIED. WATER CONTENT OF THE FIBER NOT TO EXCEED 14 PERCENT OF THE DRY MASS FIBER. THE PERCENTAGE OF MOISTURE CONTENT OF THE FIBER SHALL BE CLEARLY MARKED ON THE PACKAGE. FIBER SHALL BE COLORED GREEN TO CONTRAST THE AREA ON WHICH THE FIBER IS BEING APPLIED, AND SHALL NOT STAIN CONCRETE OR OTHER SURFACES IN WHICH IT COMES INTO CONTACT WITH. FIBER AND OTHER MULCH INGREDIENTS SHALL BE FREE FROM GROWTH OR GERMINATION INHIBITING INGREDIENTS.

4. MAINTENANCE. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AREAS DURING PLANTING PERIOD AND UNTIL OTHER WORK UNDER CONTRACT HAS BEEN COMPLETED. MAINTENANCE SHALL CONSIST OF PROTECTION, REPLANTING, MAINTAINING EXISTING GRADES, AND REPAIR OF EROSION DAMAGE. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING GRADES OF SLOPES AFTER COMMENCEMENT OF PLANTING OPERATIONS AND DURING MAINTENANCE PERIOD. PROMPTLY REPAIR ANY DAMAGE TO FINISHED SURFACE GRADES. PROMPTLY REPAIR DAMAGE IN THE EVENT EROSION OCCURS FROM RAINFALL OR OTHER CAUSES. CORRECT RUTS, RIDGES, TRACTS AND OTHER SURFACE IRREGULARITIES AND REPLANT AREAS WHERE REQUIRED PRIOR TO ACCEPTANCE. ALWAYS INSPECT EROSION CONTROL METHODS ON THE SITE WEEKLY, IF NOT DAILY. IF THE PROPOSED SYSTEM IS NOT FUNCTIONING WELL, CONTACT THE ENGINEER IMMEDIATELY. SILT FENCES SHOULD ALWAYS BE INSPECTED BEFORE AND AFTER STORMS. SILT FENCE IS TYPICALLY DESIGNED ONLY TO PERFORM FOR A PERIOD OF WEEKS. REMOVE EXCESS SEDIMENT PERIODICALLY, AT A MINIMUM WHEN THE SEDIMENT REACHES ONE-FOURTH OF THE SILT FENCE HEIGHT. EROSION CONTROL FENCES CAN BE REMOVED ONCE THE AREA HAS BEEN SUCCESSFULLY REVEGETATED SUCCESSFULLY AND THE CONSTRUCTION IS COMPLETE.

5. WATERING. APPLY WATER AFTER COMPACTION AND SEEDING. APPLY WATER USING PORTABLE PIPE OR HOSE LINES WITH ROTATING SPRINKLERS WITHIN 24 HOURS AFTER SEEDING. SPRINKLING MAY BE DONE WITH WATER TRUCKS AND HOSES IN CERTAIN LOCATIONS WHERE IT IS IMPRACTICAL TO USE PORTABLE LINES OR HOSES. SUPERVISE SPRINKLING TO PREVENT RUNOFF OF WATER. THE CONTRACTOR SHALL FURNISH ALL PUMPS, HOSES, PIPE LINES, WATER TRUCKS AND SPRINKLING EQUIPMENT REQUIRED. WATER AS REQUIRED TO ACHIEVE ACCEPTABLE GRASS COVERAGE. DO NOT WATER AT RATES EXCEEDING 2,000 GAL/AC/HR., TO PREVENT RUNOFF.

6. WEEDING. KEEP ALL SEEDED AREAS RELATIVELY FREE FROM WEEDS AND UNDESIRABLE GRASSES, USING APPROVED METHODS, MATERIALS AND TIMING.

7. SILT FENCE. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG DRIVEN 16" MINIMUM INTO GROUND . WOOD POSTS SHALL BE 1 1/2" X 1 1/2" (MINIMUM) SQUARE CUT, OR 1 3/4" (MINIMUM) DIAMETER ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 1 .00 POUND PER LINEAR FOOT. GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F: TENSILE STRENGTH 50 LBS/IN (MIN.) TEST: MSMT 509; TENSILE MODULUS 20 LBS/IN (MIN.) TEST: MSMT 509; FLOW RATE. 3 GAL/FT2/MINUTE (MAX.) TEST: MSMT 322; FILTERING EFFICIENCY 75% (MIN.) TEST: MSMT 322. WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS. SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHED 50% OF THE FABRIC HEIGHT.

8. SILT FENCE INSTALLATION: 1. SECURE FILTER FABRIC TO THE GROUND BY INSTALLING WOODEN POSTS TO A DEPTH OF 12 INCHES AND EXCAVATE A TRENCH AT LEAST SIX INCHES DEEP ALONG THE LINE OF THE POST AND UPSLOPE FROM THE BARRIER. BURY LOWER EIGHT INCHES OF FILTER FABRIC INTO THIS TRENCH AND COMPACT THE BACKFILL SOIL. 2. POSTS SHOULD BE SPACED A MAXIMUM OF 5 FEET APART. FOR SHALLOW CHANNEL FLOW APPLICATIONS, THE POSTS SHOULD BE SPACED A MAXIMUM OF THREE FEET APART AND REINFORCED WITH WIRE MESH. THE BASE OF THE FENCE SHOULD BE SECURED. 3. SILT FENCES INSTALLED ACROSS SWALES MUST HAVE THE BOTTOM OF THE ENDS OF THE FENCE AT A HIGHER ELEVATION THAN THE TOP CENTER OF THE FENCE. 4. SILT FENCES SHOULD BE INSTALLED ALONG THE CONTOUR AT LEAST FIVE FEET BELOW THE BASE OF GENTLE SLOPES IN AREAS WHERE UPGRADIENT DISTURBANCE IS OCCURRING. 5. SILT FENCES SHOULD REMAIN IN PLACE UNTIL VEGETATION HAS BEEN ESTABLISHED. 6. IN AREAS PRONE TO ROCKFALL, INSTALL A WIRE MESH FENCE UPHILL 10 FEET TO CAPTURE ROCKS THAT MAY DAMAGE THE FENCE. 7. WHEN EQUIPMENT IS WORKING NEAR SENSITIVE AREAS OR WHEN SUBSTANTIAL MOVEMENT OF FILL IS TAKING PLACE, IT MAY BE NECESSARY TO REINFORCE THE SILT FENCE WITH WIRE MESH.

9. EXPOSED SOIL SHALL BE PROTECTED FROM EROSION BY TEMPORARY AND/OR PERMANENT MEASURES, AS APPROVED.

10. PROTECTION OF DOWN SLOPES - BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED TO MINIMIZE DAMAGE TO THE FACE OF CUTS AND FILLS. DOWN SLOPES SHALL BE PROTECTED FROM SURFACE WATER RUNOFF FROM ABOVE BY DIKES, SWALES OR CUT-OFF DITCHES, OR OTHER MEASURES, AS NEEDED.

11. BUILDING SITE RUNOFF. RUNOFF FROM BUILDINGS, ROADS, DRIVEWAYS AND THE TOTAL SITE AREA SHALL BE CONTROLLED BY BERMS, SWALES, DITCHES, STRUCTURES, VEGETATIVE FILTER STRIPS AND/OR CATCH BASINS TO ADEQUATELY REDUCE THE ESCAPE OF SEDIMENT FROM THE SITE.

12. SEDIMENT AND DEBRIS CONTROL FACILITIES. TEMPORARY AND PERMANENT SEDIMENT AND DEBRIS CONTROL FACILITIES SHALL BE INSTALLED WHENEVER AND WHEREVER NECESSARY TO PROTECT THE PROJECT AND DOWNSTREAM PROPERTIES FROM EROSION AND SEDIMENT/DEBRIS DISCHARGE.

13. VEGETATIVE REMOVAL. WHERE VEGETATION IS TO BE REMOVED AND REPLACED WITHIN THE BUILDING AND ACCESS ENVELOPES, VEGETATION REMOVAL SHALL BE LIMITED TO THE NECESSARY AREA AND AS MINIMAL AS POSSIBLE.

14. TOPSOIL. TO PROMOTE RE-GROWTH OF VEGETATION, THE TOPSOIL SHALL BE STOCKPILED AND REAPPLIED UPON COMPLETION OF GRADING ON SLOPES OF LESS THAN 5:1 (20%). SOIL STOCKPILES AND EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. TEMPORARY VEGETATION SUFFICIENT TO STABILIZE THE SOIL AS PERMANENT VEGETATION COVER IS MATURING SHALL BE ESTABLISHED ON ALL DISTURBED AREAS AS NEEDED AND AS EACH STAGE OF GRADING IS COMPLETED.

15. WINTER OPERATIONS - OCTOBER 1 TO MAY 15. GRADING PROJECTS THAT ARE STARTED BUT NOT COMPLETED BY OCTOBER 15TH OF EACH YEAR ARE TO BE "WINTERIZED" BY INSTALLATION OF PLANNED EROSION AND SEDIMENT CONTROL MEASURES, WHICH SHALL BE MAINTAINED IN GOOD REPAIR THROUGH THE WINTER AND UNTIL THE PROJECT IS COMPLETED.

16. ALL PLANNED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO START OF GRADING OPERATIONS, UNLESS APPROVAL FOR PHASED CONTROL MEASURE INSTALLATION IS REQUESTED OF AND GRANTED BY THE ENGINEER AND OTHER APPLICABLE AUTHORITY PRIOR TO GRADING OR CONSTRUCTION PERMIT ISSUANCE.

17. EXTRA EROSION CONTROL MATERIALS OF STRAW, PLASTIC, NETTING, ETC., SHALL BE KEPT ON THE SITE AT ALL TIMES TO BE INSTALLED IMMEDIATELY BY THE PERMITTEE IN THE EVENT OF HEAVY RAINFALL, WIND, RUN-OFF OR OTHER ACT WHICH MIGHT CAUSE EROSION AND SEDIMENT DISCHARGE.

18. ALL MAJOR CUT AND FILL SLOPES WITHIN THE ACCESS AND BUILDING ENVELOPE WITHOUT ESTABLISHED VEGETATION SHALL BE ADEQUATELY PROTECTED BY MULCHING OR OTHER METHODS APPROVED BY THE ENGINEER AND COUNTY.

19. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING PLANTINGS AND MULCHING, SHALL BE CLOSELY MONITORED AND RUNOFF PROBLEMS CORRECTED PROMPTLY.

20. MULCHING SHALL BE ANCHORED BY PUNCHING OR TACKING INTO THE SOIL OR BY THE USE OF NETTING. A MINIMUM OF 1000 LBS. OF STRAW, OR EQUIVALENT, PER EACH 10,000 SQUARE FEET OF SLOPE SURFACE WILL BE REQUIRED TO BE ANCHORED. AN ADDITIONAL AMOUNT MAY BE REQUIRED BY THE ENGINEER. ALL EROSION AND/OR SLIPPAGE OF BANKS SHALL BE REPAIRED BY THE PERMITTEE AT HIS EXPENSE.

21. IT IS RECOMMENDED THAT WITHIN TEN (10) WORKING DAYS AFTER SEEDING, FERTILIZING AND/OR MULCHING, THE PERMITTEE WILL COMMENCE WATERING OF THE SEEDED AREAS OR SLOPES AND SHALL CONTINUE UNTIL THE RAINS COME AND/OR THE GROUND COVER IS FULLY DEVELOPED AND/OR SELF-SUFFICIENT. ALL CONTROL MEASURES INCLUDING BERMS, DIVERSION CATCH BASINS, SEDIMENT TRAPS, ETC., SHALL BE INSTALLED PRIOR TO SEEDING AND MULCHING.

22. DUST - DUST FROM GRADING OPERATIONS MUST BE CONTROLLED. DUST CONTROL SHALL CONSIST OF APPLYING WATER OR OTHER DUST PALLIATIVES, OR COVERING SMALL STOCKPILES OR AREAS, AS NECESSARY TO PREVENT OR ALLEVIATE DUST NUISANCE GENERATED BY CONSTRUCTION ACTIVITIES. PERIODIC STREET SWEEPING MAY ALSO BE REQUIRED BY THE MUNICIPALITY.

23. SEDIMENT TRACKING CONTROL. SEDIMENT SHALL BE PREVENTED OR CONTROLLED FROM BEING TRACKED OFF-SITE BY VEHICLES LEAVING THE CONSTRUCTION AREA USING APPROPRIATE BEST MANAGEMENT PRACTICES SUCH AS STABILIZED CONSTRUCTION ENTRANCES/EXITS, STABILIZED CONSTRUCTION ROADWAYS, AND ENTRANCE/EXIT TIRE WASHES.

24. PRIOR TO COMPLETION AND FINAL ACCEPTANCE OF THE PROJECT, ALL EROSION CONTROL MEASURES MUST BE IN PLACE AND ALL EXPOSED BARE SOIL SHALL BE MULCHED, FERTILIZED AND OTHERWISE PREPARED SO THAT IT IS PLANTED TO A PERMANENT VEGETATIVE COVER. NATIVE OR NATURALIZED VEGETATION SHOULD BE USED. ALL ON-SITE EROSION CONTROL FACILITIES SHALL BE PROPERLY MAINTAINED BY THE OWNERS FOR THE LIFE OF THE PROJECT SO THAT THEY DO NOT BECOME NUISANCES WITH STAGNANT WATER, HEAVY ALGAE GROWTH, INSECT BREEDING, ODORS, DISCARDED DEBRIS, AND/OR SAFETY HAZARDS. VEGETATIVE MAINTENANCE REQUIRED MAY INCLUDE MOWING, FERTILIZATION, IRRIGATION AND/OR RESEEDING.

25. THE FOLLOWING REFERENCES PROVIDE ADDITIONAL IMPORTANT INFORMATION AND GUIDANCE ON EROSION CONTROL. A) TOWN OF BLUE RIVER, COLORADO. B) DENVER REGIONAL COUNCIL OF GOVERNMENTS. C) URBAN DRAINAGE AND FLOOD CONTROL DISTRICT OF DENVER, COLORADO.

COLORADO REGISTERED PROFESSIONAL ENGINEER 04.10.2023

EROSION DETAILS & SPECIFICATIONS

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB#1, LOT 14

LITTLEHORN ENGINEERING & SURVEYING
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 HIGHWAY 285, SUITE #201
FAIRPLAY, COLORADO 80440
MAIN OFFICE 719.836.7120
SILVER CLIFF PHONE 719.783.3757

PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
△ -
△ -

AN ADVANCED TREATMENT ADVANTEX AX-25RT-(MODE 3B) PRESSURIZED GRAVEL

ON-SITE WASTEWATER TREATMENT SYSTEM

311 WAGON ROAD, BLUE RIVER, CO 80424

A PERMIT IS REQUIRED FROM SUMMIT COUNTY TO INSTALL THIS 4 BEDROOM OWTS SYSTEM

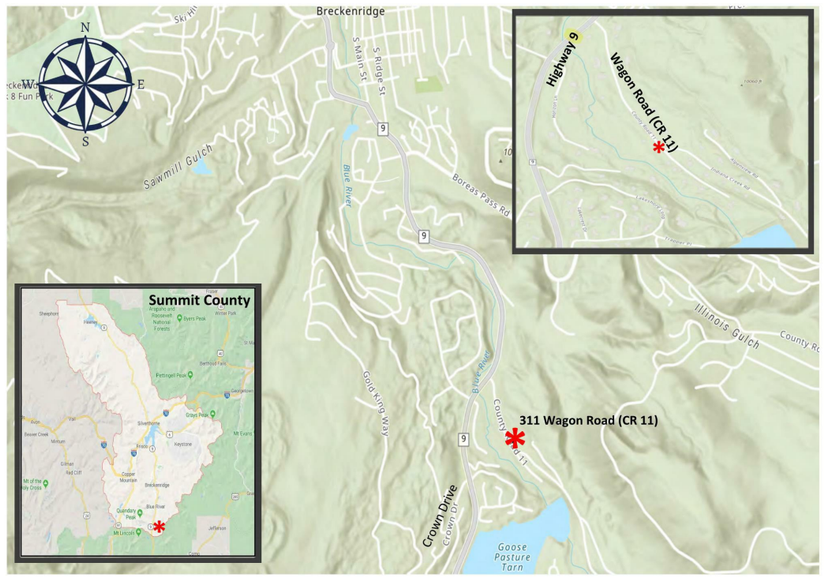
INSPECTION REQUIREMENTS:

1. THE COUNTY WILL CONDUCT INSPECTIONS AS REQUIRED BY THEIR PERMIT.
2. IT IS HIGHLY RECOMMENDED THAT THE CLIENT CONTACT THE ENGINEER AND SCHEDULE A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED LAYOUTS AND DESIGN.
3. THE ENGINEER SHALL BE CONTACTED TO PERFORM THREE INSPECTIONS OF THE SEPTIC SYSTEM:
   1. AN OPEN HOLE OF THE SEPTIC TANK AND STA.
   2. A PRE-COVER INSPECTION (PRIOR TO BACKFILL).
   3. A FINAL GRADE INSPECTION AFTER BACKFILL. ANY EQUIPMENT SHOULD BE OPERATIONAL AND ACCESSIBLE DURING THIS INSPECTION. IF A POTABLE WELL IS PLANNED, IT SHOULD BE DRILLED BY THE TIME OF THIS INSPECTION.
4. SOILS COMPACTION SHALL BE TESTED AS REQUIRED (REFER TO SHEET D5 FOR COMPACTION NOTES).
5. IF RETAINING WALLS ARE TO BE INSTALLED WITHIN 25 FEET OF THE STA, THESE SHALL BE INSPECTED AT THE BEGINNING OF THE INSTALLATION, DURING THE INSTALLATION, AND AFTER COMPLETION.

SOME ABBREVIATIONS USED:

AM:	AS MEASURED WITH HAND TAPE
BOC:	BOTTOM OF CHAMBER
BOG:	BOTTOM OF GRAVEL
BOS:	BOTTOM OF SAND
BR:	BEDROOM
CH:	INFILTRATOR CHAMBER
EXT:	EXISTING
OWTS:	ON-SITE WASTEWATER TREATMENT SYSTEM (PREVIOUSLY KNOWN AS ISDS)
RV:	RECREATIONAL VEHICLE OR CAMPER
SFR:	SINGLE-FAMILY RESIDENCE
STA:	SOIL TREATMENT AREA (AKA LEACH FIELD OR ABSORPTION BED)
TBD:	TO BE DETERMINED
TOCH:	TOP OF CHAMBER
TOG:	TOP OF GRAVEL
TOR:	TOP OF RISER
TOS:	TOP OF SAND
TOT:	TOP OF TANK

VICINITY MAP 2022-100742
HACKEBEIL - 311 Wagon Road



VICINITY MAP

PROPERTY INFORMATION
SPILLWAY SUB #1, LOT 14
311 WAGON ROAD
BLUE RIVER, CO 80424
COUNTY SCHED. #100742

DRAWINGS PREPARED FOR:
LANDYN & MICHELLE HACKEBEIL
405 FRONT STREET
COMFORT, TX 78013

THE SEPTIC TANK AND ON-SITE WASTEWATER TREATMENT SYSTEM SHALL BE COMPRISED OF THE MATERIALS AND EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE COUNTY HEALTH DEPARTMENT AND THE STATE OF COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT. OPERATING PERMITS ARE REQUIRED FOR CERTAIN TYPES OF SYSTEMS. REFER TO THE COUNTY REGULATIONS FOR MORE INFORMATION.

SHEET INDEX

#8

CONTRACTOR SHALL OBTAIN COUNTY APPROVAL BEFORE ORDERING MATERIALS AND PRIOR TO ANY CONSTRUCTION.

CONTRACTOR INSTALLATION REFERENCE TABLE:

SEPTIC TANK:

VALLEY PRECAST 1500 GALLON TOP SEAM 2 COMPARTMENT CONCRETE TANK WITH EFFLUENT FILTER
- ITEM #1500T-2CP-F (UPSTREAM)
-ADVANTEX AX-25RT-(MODE 3B) ADVANCED TREATMENT UNIT (DOWNSTREAM)

SOIL TREATMENT AREA:

SIZE: 10'X40' GRAVEL BED OVER 15'X45' SAND BASIL AREA

DEPTH: 54" MAX. ALONG THE HIGH SIDE OF SAND BASIL. KEY IN SAND AT LEAST 10" ALONG THE LOW SIDE OF SAND BASIL.

MATERIALS: 24" CLEAN SECONDARY-TYPE SAND, 1" OR 1.5"Ø GRAVEL. 8.5" GRAVEL BELOW PIPE AND 2" GRAVEL ABOVE PIPE.

LATERALS: 3, 1.5"Ø SCH 40 PVC, USE ORIFICE SHIELDS BY SIM/TECH (STF-106D) OR ORENCO (OS150).

ORIFICES: 7/32"Ø @ 24" O.C. AT 6:00 WITH ORIFICE SHIELDS. 19 ORIFICES PER LATERAL, 57 TOTAL.

COLORADO LICENSED
JOHN J. LITTLEHORN
37404
PROFESSIONAL ENGINEER
04.10.2023

DIG SAFELY - CALL 811
GAS/ELECTRIC/TELEPHONE/CABLE
WWW.UNCC2.ORG

OWTS COVER SHEET
311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

LITTLEHORN ENGINEERING, LLC
351 US HWY 285, #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
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"PEACE OF MIND THROUGH HOLISTIC DESIGN"

PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

COVER

CONSTRUCTION NOTES- CONSTRUCTION NOTES SHALL GOVERN ALL SEPTIC (OWTS) DRAWINGS

#9

GENERAL

1. THE SITE IS NOT SERVED BY A PUBLIC WASTEWATER SYSTEM SO THE PROPOSED RESIDENCE WILL HAVE TO BE SERVED BY A PRIVATE, ON-SITE WASTE DISPOSAL TREATMENT SYSTEM (OWTS). AS REQUESTED, WE HAVE PREPARED THESE DESIGN DRAWINGS TO PRESENT THE METHODOLOGY AND ENGINEERING FOR THE NEW DISPOSAL SYSTEM.

2. CONTRACTOR SHALL PROVIDE MATERIALS AND WORKMANSHIP AS MAY BE REQUIRED TO COMPLETE THE NECESSARY WORK IN ACCORDANCE WITH THE DESIGN DRAWINGS AND ANY MUNICIPALITY REQUIREMENTS. THE DESIGN DRAWINGS AND SPECIFICATIONS HEREIN REFER TO THE ONSITE WASTEWATER TREATMENT SYSTEM (OWTS). THIS INCLUDES WASTEWATER PIPING LOCATED OUTSIDE THE RESIDENCE. PIPING WITHIN THE RESIDENCE IS REGULATED BY OTHER APPLICABLE BUILDING & PLUMBING REGULATIONS.

3. THE OWNER AND BUILDER SHALL BE RESPONSIBLE FOR AND VERIFY, PRIOR TO CONSTRUCTION COMMENCEMENT: 1) PERMIT ISSUANCE, 2) SITE CONDITIONS, 3) ALL SITE SETBACKS, 4) BUILDING LOCATIONS, 5) COMPONENT DIMENSIONS, 6) MATERIALS, 7) QUANTITIES, AND 8) ELEVATIONS AND GRADE FINISHES. ALL WORK SHALL COMPLY WITH APPLICABLE GOVERNING CODES, HEALTH DEPARTMENT ORDINANCES, LAWS, AND MANUFACTURER'S SPECIFICATIONS.

4. IT IS THE OWNER'S AND CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE DISPOSAL SYSTEM IS: 1) DESIGNED FOR THE CORRECT NUMBER OF BEDROOMS AND APPLIANCES, 2) WILL MEET ALL SETBACK REQUIREMENTS, AND 3) IS INSTALLED PER THIS ENGINEERED DESIGN, COUNTY GUIDELINES, NATIONAL ELECTRIC CODE, AND COLORADO STATE GUIDELINES.

5. IF NOT ALREADY COMPLETED, A REGISTERED SURVEYOR SHOULD CONDUCT A BOUNDARY SURVEY TO ENSURE THAT THE PROPERTY PINS ARE IN THEIR CORRECT LOCATIONS AND HAVE NOT BEEN MOVED.

6. THESE PLANS ARE NOT AN INSTALLATION MANUAL. INSTALLATION MANUALS AND CODES ARE LISTED ON THIS SHEET. THE CONTRACTOR SHALL NOTIFY ENGINEER OF DETAILS NOT SHOWN ON PLANS THAT ARE NECESSARY FOR THE WORK TO PROCEED.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL METHODS OF CONSTRUCTION AND CONSTRUCTION SEQUENCING, INCLUDING TEMPORARY BRACING OR SHORING REQUIRED TO PROTECT WORKERS, THE EXCAVATED TRENCHES, AND ANY EXCAVATED HOLES, AS MAY BE REQUIRED. SITE VISITS BY THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE. JOB-SITE SAFETY IS BEYOND THE SCOPE OF THESE DRAWINGS AND THE ABILITY OF THE ENGINEER TO MANAGE. THE OWNER AND CONTRACTOR BEAR ALL RESPONSIBILITY FOR THEIR OWN SAFETY AND THE SAFETY OF EMPLOYEES, WORKERS, AND ALL PASSERSBY'S.

8. LOCATE ALL BURIED UTILITIES PRIOR TO ANY CONSTRUCTION.

9. ALL MATERIALS SHALL BE PROTECTED WITH SUITABLE TEMPORARY WEATHER FACILITIES AS MAY BE REQUIRED TO PROTECT MATERIALS FROM DAMAGE DURING CONSTRUCTION. WEATHER PROTECTION AND SNOW REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND OWNER.

10. DO NOT SCALE DRAWINGS. VERIFY LINES & DIMENSIONS ON DRAWINGS PRIOR TO ANY WORK. CALL ENGINEER FOR ANY DIMENSIONING QUESTIONS.

11. SURFACING OF PARKING AND DRIVE AREAS: IF THE AREA ABOVE THE TANK OR SEWER LINE IS TO BE PAVED WITH CONCRETE OR ASPHALT OR SIMILAR MATERIALS, THE ENGINEER SHALL BE NOTIFIED FOR SOILS TESTING OF THE BACKFILL PLACED WITHIN ANY EXCAVATED TRENCHES AND HOLES. IF SOILS TESTING IS NOT PERFORMED, THE SOIL MAY SETTLE AND CRACK THE ASPHALT OR CONCRETE PAVING. WHERE THE ACCESS ROAD IS PAVED, DRIVES ARE USUALLY PAVED (THIS MAY BE REQUIRED BY THE MUNICIPALITY).

12. RE-VEGETATION, LANDSCAPING WORK, AND EROSION CONTROL SYSTEMS ARE OUTSIDE THE SCOPE OF THESE PLANS. THIS WORK SHALL BE IN ACCORDANCE WITH THE APPLICABLE LAND USE AND DEVELOPMENT CODE.

13. IF A RETAINING WALL OR SUBSURFACE DRAIN IS TO BE LOCATED BELOW AND WITHIN 25 FEET OF THE STA, IT SHALL BE DESIGNED BY AN ENGINEER REGARDLESS OF THE HEIGHT.

14. SNOW STACK SPACE: THE STA, SEPTIC TANK, AND SEWER PIPE AREAS SHALL NOT BE USED AS A SNOW STORAGE AREA.

CODES GOVERNING MATERIALS AND WORKMANSHIP:

ASTM:	AMERICAN SOCIETY FOR TESTING AND MATERIALS.
CDPHE:	COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT.
IRC:	RESIDENTIAL/BUILDING CODE & ADOPTED PLUMBING CODE & ELECTRICAL CODE
MSDS:	MATERIAL SAFETY DATA SHEETS
NSF:	NATIONAL SANITATION FEDERATION INTERNATIONAL
OSHA:	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
SCEHD:	SUMMIT COUNTY ENVIRONMENTAL HEALTH DEPARTMENT
UL:	UNDERWRITERS LABORATORIES, INC.
WATER:	STATE OF COLORADO & DIVISION OF WATER RESOURCES

15. THE RESIDENCE AND DRIVEWAY DIMENSIONS MAY BE GENERALLY SHOWN. THE PROPOSED DRIVEWAY AND RESIDENCE LOCATION, DIMENSIONS, SITE LAYOUT, ETC. SHALL BE VERIFIED PRIOR TO CONSTRUCTION. IF DEVELOPMENT PLANS ARE DIFFERENT FROM WHAT IS SHOWN HEREIN, PLEASE NOTIFY THE ENGINEER.

16. TREE CLEARING SHALL BE COMPLETED IN ACCORDANCE WITH FIRE REGULATIONS, SUBDIVISION REGULATIONS, HOME OWNERS DESIRES, AND COUNTY REGULATIONS.

17. INSULATION: THE STA, SEPTIC TANK, AND SEWAGE PIPING HAS BEEN DESIGNED WITH A MINIMUM SPECIFIED SOIL COVER. THE MINIMUM SOIL COVER ASSUMES THE SYSTEM IS USED PROPERLY, ON A FULL-TIME BASIS, AND IS MAINTAINED PROPERLY. IF ANY OF THESE THREE ITEMS ARE LACKING, THE SYSTEM MAY FREEZE. AS AN EXTRA PRECAUTIONARY METHOD THE SEPTIC TANK, BUILDING SEWER, AND EFFLUENT SEWER LINE MAY BE INSULATED OR HEAT-TAPED ON THE EXTERIOR. THE STA SHALL NOT BE INSULATED AS THE "FOAM" WILL HINDER EVAPORATION FROM THE STA. REFER TO SYSTEM MAINTENANCE AND OPERATION GUIDELINES.

GROUND AND IRRIGATION WATER:

1. WATER AND MOISTURE IN AND AROUND STA'S IS A MAJOR PROBLEM IN THE MOUNTAIN AREAS, DUE TO SNOW MELT. TO MITIGATE WATER APPROPRIATELY AWAY FROM THE OWTS, THE STA HAS BEEN DESIGNED TO BE A VERY SPECIFIC VERTICAL DISTANCE ABOVE THE AVERAGE SEASONAL WATER TABLE. REFER TO STA CROSS SECTION FOR DESIGN DEPTHS.

2. SEPTIC TANKS SHALL NOT BE PLACED WITHIN A 100 YEAR FLOOD PLAIN OR NEAR ANY TYPE OF FLOODWAY UNLESS OTHERWISE APPROVED BY THE ENGINEER. WHEN PLACED IN OR NEAR THESE AREAS, APPROVAL FROM THE ENGINEER IS REQUIRED. TYPICALLY THE TOP OF THE TANK IS MAINTAINED AT LEAST 18 INCHES ABOVE THE BASE FLOOD ELEVATION AND PROTECTED BY A SURROUNDING DRAIN/SUMP. SEPTIC TANKS WHICH ARE PLACED IN HIGH GROUND WATER AREAS SHALL BE WATERPROOFED AND A TOP SEAM TANK SHALL BE USED. SOME COUNTIES NOW REQUIRE TOP SEAM TANKS FOR ALL SEPTIC TANKS.

3. FOUNDATION DRAINS AND WATER SOURCES MUST NOT BE DIRECTED TOWARDS SEPTIC TANKS, STA'S, WELLS, OR BURIED UTILITIES. EROSION MUST ALSO BE CONSIDERED AND MITIGATED PER COUNTY REQUIREMENTS AT DAYLIGHT LOCATIONS.

4. LAWN SPRINKLER HEADS, SNOW BUILDUP AND IMPROPER WATER MITIGATION PRACTICES CAN CAUSE REAL PROBLEMS FOR THE SEPTIC SYSTEM AND MUST BE APPROPRIATELY CONTROLLED.

WATER SUPPLY

1. WHEN WATER FOR THE RESIDENCE IS TO BE OBTAINED FROM A PRIVATE WELL OR DEVELOPED SPRING, IT SHALL BE DRILLED/INSTALLED/DEVELOPED AT THE MINIMUM SPECIFIED DISTANCE SHOWN IN THE SITE PLAN FROM THE STA AND AT LEAST 50 FEET FROM THE SEPTIC TANK AND SEWER LINES. ALL SPRINGS/WELLS REQUIRE STATE APPROVAL.

2. ACCESS, UTILITY LINES, EASEMENTS, AND OTHER CRITERIA MUST BE EVALUATED BY A QUALIFIED WELL DRILLER TO ENSURE THE WELL CAN BE DRILLED AT THE PROPOSED LOCATION SHOWN. THE ATTACHED PLAN SHOWS A LOCATION FOR THE WELL THAT IS ONLY INTENDED TO MEET THE SETBACK REQUIREMENTS.

3. EXISTING AND PROPOSED WELL LOCATIONS WITHIN 200 FEET OF THE PROPOSED SEPTIC SYSTEM ARE TYPICALLY DEPICTED IN THE DRAWINGS. SOMETIMES DUE TO SNOW COVER, BUILDINGS, OR OTHER ISSUES ALL NEIGHBORING WELLS CAN NOT BE LOCATED. THE CONTRACTOR SHALL VERIFY SUCH LOCATIONS BEFORE THE WASTE DISPOSAL SYSTEM IS INSTALLED.

4. THE WELL SHALL BE GROUTER PER STATE AND COUNTY REQUIREMENTS.

GRADING AND EXCAVATION SPECIFICATIONS:

1. ALL FINISH SLOPES MUST SLOPE AWAY FROM BUILDINGS, BUILDING SEWER, SEPTIC TANK(S), EFFLUENT LINES, AND STA AREAS. WHEN INSTALLING BERMS, SUBSURFACE DRAINS, AND OTHER METHODS TO MITIGATE THE WATER AWAY FROM THESE AREAS, BE SURE THE HISTORICAL FLOW QUANTITIES AND PATTERNS ARE VERIFIED AND MAINTAINED FOR ANY WATER LEAVING THE SITE.

2. WHEN THE GRADING/EXCAVATION OPERATIONS ENCOUNTER REMAINS OF PREHISTORIC PEOPLE'S DWELLING SITES, REMAINS, OR ARTIFACTS OF HISTORICAL, PALEONTOLOGICAL OR ARCHAEOLOGICAL SIGNIFICANCE, THE OPERATIONS SHALL BE TEMPORARILY DISCONTINUED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND PROMPTLY CONTACT THE PROPER AUTHORITIES TO DETERMINE THE DISPOSITION THEREOF. IF REQUIRED BY STATE OR FEDERAL AUTHORITIES, THE CONTRACTOR SHALL PRESERVE THE AREA OF SIGNIFICANCE TO ALLOW AUTHORITIES TO EXCAVATE AND RECOVER THE ITEMS OF SIGNIFICANCE.

3. AT ALL TIMES, PRECAUTIONS SHALL BE TAKEN FOR THE PROTECTION OF CULVERTS, EROSION CONTROL STRUCTURES, IRRIGATION CROSSINGS, SURVEY MONUMENTS, UNDERGROUND OR OVERHEAD UTILITY LINES AND ALL OTHER PUBLIC OR PRIVATE INSTALLATIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. ANY DAMAGE TO SUCH STRUCTURES SHALL BE REPAIRED, DOCUMENTED AND SUBMITTED TO THE APPROPRIATE AUTHORITY.

4. CLEARING AND GRUBBING. ALL TREES AND OTHER VEGETATION SHALL BE SALVAGED WHERE POSSIBLE (VERIFY WITH THE HOME OWNER BEFORE REMOVING TREES). STUMP HOLES AND OTHER HOLES FROM WHICH OBSTRUCTIONS ARE REMOVED, SHALL BE BACKFILLED (AND COMPACTED WHEN REQUIRED) WITH SUITABLE MATERIALS. STUMPS, DEBRIS, AND WOOD SHALL NOT BE PLACED IN ANY TRENCHES OR USED FOR ANY BACKFILL. ALL TREES AND SHRUBS WITHIN 10 FEET OF THE STA AND SEPTIC TANK AND WITHIN 5 FEET OF THE WASTE WATER PIPING SHALL BE CLEARED. MATERIALS AND DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE AND COUNTY REGULATIONS. WITH OWNER APPROVAL, STUMPS MAY BE BURIED ON-SITE AT AN APPROVED LOCATION.

5. TOPSOIL. ALL TOPSOIL, WHERE PHYSICALLY PRACTICABLE, SHALL BE SALVAGED. TOPSOIL SHALL CONSIST OF LOOSE FRIABLE LOAM REASONABLY FREE OF ADMIXTURES OF SUBSOIL, REFUSE, STUMPS, OR TREE ROOTS. MATERIALS SELECTED FOR TOPSOIL SHALL BE EXCAVATED AND STOCKPILED AS REQUIRED. TOPSOIL SHALL BE KEYED TO THE UNDERLYING MATERIALS BY THE USE OF HARROWS, ROLLERS, OR OTHER EQUIPMENT SUITABLE FOR THE PURPOSE. FOR SITES THAT DON'T CONTAIN ENOUGH REUSABLE TOP SOIL, APPROVED TOP SOIL WILL HAVE TO BE IMPORTED TO THE SITE. SITES WITH MORE THAN 1.0 ACRE OF DISTURBANCE REQUIRE SPECIAL PERMITTING.

6. EXCAVATION. VIBRATORY EQUIPMENT AND OTHER EQUIPMENT WHICH MIGHT COMPACT THE SOILS SHALL BE KEPT OUT OF THE STA BED. IF A RUBBER TIRED VEHICLE ABSOLUTELY MUST BE USED WITHIN THE STA, SCARIFY THE SOILS VERY CAREFULLY BEFORE STA CONSTRUCTION TO ENSURE THE UNDERLYING SOILS ARE NOT COMPACTED. SHORTCUTTING GOOD CONTRACTOR PRACTICE WILL CAUSE PREMATURE STA FAILURE (SEE COMPACTION BELOW).

7. WHEN GROUND WATER IS ENCOUNTERED, THE CONTRACTOR SHALL PUMP, OR OTHERWISE REMOVE ANY WATER THAT ACCUMULATES IN THE TRENCHES, TANK HOLE, AND STA. MATERIALS SHALL NOT BE CONSTRUCTED IN WATER AND WATER SHALL NOT BE ALLOWED TO DRAIN THROUGH THE SEWER PIPE. AT THE END OF THE DAY, THE OPEN END OF THE PIPE SHALL BE KEPT CLOSED BY PLACING A WATERTIGHT FITTING PLUG INTO THE BELL END TO PREVENT WASHING OF ANY FOREIGN MATTER INTO THE LINE. ALL WATER REMOVED FROM THE CONSTRUCTION SITE SHALL BE CONVEYED IN A PROPER MANNER TO A SUITABLE POINT OF DISCHARGE AND SHALL COMPLY WITH THE APPLICABLE EROSION, SEDIMENTATION AND WATER CONTROL LAWS.

8. BACKFILLING SHALL BE THE RESPONSIBILITY OF THE OWNER/CONTRACTOR. ALL DISTURBED AREAS SHOULD BE RESEEDED TO MITIGATE EROSION. IT IS GOOD PRACTICE TO SLIGHTLY MOUND THE AREA OVER THE TRENCHES, THE TANK, AND THE STA AREAS TO MITIGATE SURFACE WATER AWAY FROM THESE AREAS.

9. COMPACTION. ALL PLACED FILL SHALL BE BROUGHT TO THE PROPER MOISTURE CONTENT AND ADEQUATELY COMPACTED TO PREVENT SETTLEMENT. CALL ENGINEER FOR INSPECTION OF THE ABOVE ITEMS AS REQUIRED. SOILS WHICH ARE NOT TESTED FOR COMPACTION ADEQUACY MAY SETTLE AND LEAD TO SYSTEM FREEZING AND PREMATURE FAILURE. A) HOUSE: SOILS BELOW THE BUILDING SLAB AND BELOW ANY HOUSE FOOTINGS SHALL BE ADEQUATELY COMPACTED AS REQUIRED BY THE HOUSE GEOTECHNICAL ENGINEER OF RECORD; B) SEPTIC TRENCHES AND SEPTIC TANK: SOILS SHOULD BE COMPACTED TO MINIMUM 95% STANDARD PROCTOR AND WITHIN 2% OF OPTIMUM MOISTURE. COMPACT SOILS UNDER PIPE IN TRENCHES AND UNDER SEPTIC TANK AREA WITH SHEEPSFOOT ROLLERS, MULTIPLE-WHEEL PNEUMATIC-TIRED ROLLERS, OR OTHER APPROVED EQUIPMENT. FILL-TYPE SOILS SHALL BE PLACED IN NO MORE THAN 10-INCH LOOSE LIFTS; C) SOIL TREATMENT AREA: AREAS UNDER THE STA SHALL NOT BE COMPACTED; KEEP TIRED AND TRACK-TYPE EQUIPMENT OUT OF THE EXCAVATED BED WHEN THE LAST 12 INCHES IS EXCAVATED. WHEN AN STA CONTAINS MORE THAN 24 INCHES OF SAND, THE SAND SHALL BE CONSOLIDATED BY THE APPLICATION OF CLEAN WATER OVER EVERY 12-INCH SAND LAYER/LIFT. ANY TYPE OF MECHANICAL COMPACTION OF THE SAND & STA IS PROHIBITED.

GENERAL CONSTRUCTION & SITE NOTES

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

LITTLEHORN ENGINEERING, LLC
351 US HWY 285, #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757

"PEACE OF MIND THROUGH HOLISTIC DESIGN"

PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

D0

#10

PROJECT SUMMARY AND SOILS TESTING

1. THE OWNERS ARE PREPARING TO INSTALL A NEW WASTEWATER DISPOSAL SYSTEM FOR A PROPOSED SINGLE-FAMILY RESIDENCE. A CONVENTIONAL-TYPE SEPTIC SYSTEM CANNOT BE PLACED ON THE PROPERTY AND MEET COUNTY REQUIRED SETBACKS. ACCORDINGLY AN ADVANCED-TREATMENT TYPE SEPTIC SYSTEM IS DESIGNED.

4. THE SURFACE GEOLOGY OF THE LOT IS COMPRISED GENERALLY OF ORGANIC TOPSOIL WITH PINE TREES, NATIVE GRASSES, AND SHRUBS.

3. WE VISITED THE REFERENCED SITE ON OCTOBER 4, 2022 WHEN THE WEATHER WAS CLEAR AND SITE WAS ENITRELY CLEAR OF SNOW. PROFILE AND SOIL TESTING HOLES WERE EXCAVATED ON THE PROPERTY IN THE AREA OF THE PROPOSED STA AND EXAMINED. THESE HOLES REVEALED THE FOLLOWING:

Soil Profile Hole B (96-inch depth)

	HOLE	DEPTHS	DESCRIPTION	SHAPE	GRADE	TYPE	COLOR
ROCK	55%	0 – 4"	Organic topsoil with medium to fine roots	GR	WK	2A	Dark brown
SLOPE SHAPE	LV						
NOTES ↓ No standing water. No smearing.		4 - 96"	Sandy loam with gravel cobble and boulders. Fine roots to 60"	BK	WK	R2/2A	Tan

Soil Profile Hole C (96-inch depth)

	HOLE	DEPTHS	DESCRIPTION	SHAPE	GRADE	TYPE	COLOR
ROCK	60%	0 – 4"	Organic topsoil with medium to fine roots	GR	WK	2A	Dark brown
SLOPE SHAPE	LL						
NOTES ↓ No standing water. No smearing.		4 - 96"	Sandy loam with gravel cobble and boulders. Fine roots to 60"	BK	WK	R2/2A	Tan

DESIGN CRITERIA

1. BASED ON THE DATA RECORDED FROM THE REFERENCED SITE, R2/SOIL TYPE 2A WILL BE USED FOR THE DESIGN.

2. A SEASONAL HIGH GROUND WATER TABLE IS POSSIBLE AT 54" BELOW THE SURFACE. (TO BE SPRING VERIFIED)

GENERAL SETBACKS NOTES:

1. STA: PLACE STA AT LEAST (A) 10' FROM ALL PROPERTY LINES, (B) 20' FROM ANY STRUCTURE WITH A FOUNDATION DRAIN; (C) 10' FROM ANY STRUCTURE WITHOUT A FOUNDATION DRAIN; (D) 25' FROM A LAKE, WATER COURSE, IRRIGATION DITCH, STREAM, AND/OR WETLAND WITH ADVANCED TREATMENT (TL3N); (E) 5' FROM SEPTIC TANK; (F) AT LEAST 100 FEET FROM ANY POTABLE SPRING/WELL (WITHOUT JUSTIFICATION), OR SUCTION LINE. FOR TL3N EFFLUENT, A REDUCTION TO 75 FEET IS ALLOWED IF A VARIANCE FROM THE WATER WELL CONSTRUCTION REGULATIONS IS OBTAINED.; (G) 25' FROM A DRY GULCH, CUTBANK, OR SWALE AND; (H) 100' FROM ANY WATER CISTERN UNLESS A VARIANCE IS OBTAINED IN ACCORDANCE WITH DIVISION OF WATER RESOURCES, RULE 18.2.

2. SEPTIC TANK: PLACE SEPTIC TANK AT LEAST (A) 50' FROM ALL WELL HEADS AND SPRINGS, (B) 10' FROM ALL PROPERTY LINES, (C) 5' FROM ANY DWELLING OR OCCUPIED STRUCTURE, (D) 50' FROM A LAKE, WATER COURSE, STREAM, WATER CISTERN, IRRIGATION DITCH AND/OR WETLAND (E) 10' FROM FROM A DRY GULCH OR SWALE.

3. WATER LINES: ALL POTABLE WATER SUPPLY LINES SHALL BE POSITIONED A MINIMUM OF 10' FROM THE SEPTIC TANK AND SEWAGE PIPING AND 25' FROM AN STA.

4. SEWAGE PIPING: ALL SEWAGE PIPING SHALL BE LOCATED AT LEAST 50' FROM A WELL HEAD, LAKE, WATER COURSE, STREAM, WATER CISTERN, IRRIGATION DITCH AND/OR WETLAND, 10' FROM ALL PROPERTY LINES, AND 3 FEET FROM ANY DECK FOOTING OR

OWTS DESIGN FLOWS AND CALCULATIONS

1. THE AVERAGE FLOW AND DESIGN SEWAGE WASTE FLOWS DISCHARGED TO THE SOIL TREATMENT AREA (STA) EVERY DAY, AS REQUIRED BY THE COUNTY AND AS LISTED UNDER THE RESIDENTIAL WASTEWATER DESIGN FLOW TABLE FOR A FOUR (4) BEDROOM SINGLE-FAMILY RESIDENCE WITH A CLOTHES WASHER, ONE (1) AUTOMATIC DISHWASHERS, A GARBAGE DISPOSAL.

AVERAGE FLOW : 4 BEDROOM = 600 GALLONS PER DAY (GPD)
(TABLE 13-1)

2. DUE TO SOIL TYPE, A PUMP IS REQUIRED BY SUMMIT COUNTY. PER TABLE 15-1, A TANK THAT IS AT LEAST 1500 GALLONS IS REQUIRED. A 1500 GALLON TWO COMPARTMENT TANK (TOTAL TANK CAPACITY IS 1509 GALLONS) SHALL BE INSTALLED ALONG WITH AN ORENCO ADVANTEX AX25RT-3B ADVANCED TREATMENT UNIT (CONTAINING THE DISCHARGE PUMP) DOWNSTREAM OF THE PRIMARY TANK. THE LIQUID VOLUME OF 1500 GALLONS SHALL BE PROVIDED IN THE FIRST TWO COMPARTMENTS OF THE PRIMARY TANK. THIS WILL PROVIDE 2.52 DAYS (1509/600) OF RETENTION FOR THE WASTEWATER PRIOR TO THE PUMPING VAULT.

3. WITH A DESIGN FLOW OF 600 GPD AND 5 DOSES PER DAY, A 120 (600/5) GALLON DOSE IS RECOMMENDED. A 12-INCH DRAW-DOWN EQUATES TO A 121+/- GALLON DOSE. USE AN ORENCO MODEL PF5005 HIGH HEAD EFFLUENT PUMP IN THE TANK .TIMED DOSING IS REQUIRED BY THE COUNTY. THE TANK MANUFACTURER, VALLEY PRECAST, SHALL INSTALL THE PUMP CONTROL PANEL AS REQUIRED BY ADOPTED COUNTY AND STATE REGULATIONS AND PER MANUFACTURER SPECIFICATIONS.

4. FOR AN STA WITH TL3N EFFLUENT TREATMENT (ORENCO ADVANTEX AX25-RT MODE 3B) AT THE SEPTIC TANK AND DISCHARGE INTO A DEEP SECONDARY SAND FILTER AND THEN TO A NATIVE SOIL TYPE R2/ 2A INTERFACE AT THE BOTTOM OF THE SAND FILTER:

APPLICATION FACTORS

BED IS PRESSURE DOSED: 1.0 (TABLE 16-1)

BED IS GRAVEL: 1.0 (TABLE 16-2)

(NO APPLICATION FACTORS ALLOWED FOR R-TYPE SOILS)

COLORADO LICENSED JOHN J. LITTLEHORN 37874 PROFESSIONAL ENGINEER
04.10.2023

TOP OF SAND/BOTTOM OF GRAVEL

4.1 RECEIVING SOIL IS SAND VIA TREATMENT LEVEL 3N: FLOW/LTAR FOR SAND = 600 GPD /1.55 LTAR X 1.0 = 388 SQFT.

4.2 A GRAVEL BED THAT IS 10 FEET X 40 FEET IS PROPOSED. THIS WILL PROVIDE 400 SQUARE FEET.

4.3 SAND LOADING RATE WILL BE 15 GALLONS PER LINEAR FOOT (600 GPD/ 40 FEET.)

BOTTOM OF SAND FILTER UNDER THE STA

4.4 FLOW/LTAR FOR INSITU SOIL TYPE 2A, TL3N = 600 GPD /0.9 LTAR X 1.0 = 667 SQFT.

4.5 A SAND BED THAT HAS A BASIL AREA OF 15 FEET IN WIDTH AND 45 FEET IN LENGTH SHALL BE INSTALLED. THIS WILL PROVIDE 675 SF.

4.6 SOIL LOADING RATE WILL BE 13.3 GALLONS PER LINEAR FOOT (600 GPD/ 45 FEET.)

5. NOTE: THE ABOVE SIZES AND CALCULATIONS ARE FROM THE OWTS REGULATIONS WHICH ARE PRESCRIPTIVE IN THE REQUIRED SAND AND GRAVEL STA SIZES.

SOIL TREATMENT AREA (STA):

1. STRIP ALL TOPSOIL (SEE GRADING & EXCAVATION SPECIFICATIONS ON SHEET D0) IN THE AREA OF THE NEW BED AND EXCAVATE A LEVEL BED WHERE SHOWN IN THE SITE PLAN THAT IS 50 INCHES IN DEPTH (ALONG THE HIGH SIDE) X 15 FEET WIDE X 45 FEET IN LENGTH. BE SURE TO KEEP RUBBER TIRED AND OTHER EXCAVATION-TYPE EQUIPMENT OUT OF THE STA BED WHEN THE LAST 12 INCHES OF THE BED IS EXCAVATED.

2. INSTALL AT LEAST 24 INCHES OF SECONDARY-TYPE CLEAN SAND* ** THAT IS FREE OF ORGANIC MATTER, DIRT, DEBRIS, SNOW, ICE, AND ROCKS THAT MEETS THE FOLLOWING ASTM 33 CRITERIA SHALL:

2.1. PASS A SCREEN HAVING FOUR MESHES TO THE INCH;
2.2. HAVE AN EFFECTIVE SIZE BETWEEN 0.15 AND 0.60 MM;
2.3. FINES PASSING A #200 SIEVE SHALL NOT EXCEED 3%;
2.4. HAVE A UNIFORMITY COEFFICIENT OF 7.0 OR LESS.

3. AFTER SAND APPROVAL* AND SAND INSTALLATION, INSTALL AT LEAST 8-9 INCHES OF CLEAN (DIRT AND SAND FREE) GRADED, COARSE 1" OR 1-1/2" GRAVEL* IN THE ENTIRE BED TO BE USED AS THE STA CONFORMING TO THE FOLLOWING TABLE:

SIEVE SIZE%	PASSING BY WEIGHT%
$2\frac{1}{2}$"	100
3/4 -1"	0-20
4	0-3

* SUBMIT A MATERIAL ANALYSIS TO LITTLEHORN; IF A SIEVE AND MATERIAL ANALYSIS IS UNAVAILABLE, A SAMPLE OF THE MEDIA MUST BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
** THE BASIL AREA OF THE SAND BED SHALL BE KEYED IN BELOW ALL ORGANIC TOPSOIL

3.1 WHEN THE GRAVEL IS INSTALLED, IT MUST CREATE A LEVEL AREA FOR THE DISTRIBUTION PIPING.
3.2 ALL GRAVEL MUST BE FREE OF DIRT; AVOID PICKING UP DIRT, DEBRIS (STICKS, ROOTS, LEAVES) AND ANY ICE AND SNOW WITH THE LAST BUCKETS OF GRAVEL PUT ON THE STA.
3.3 FOR SOME ADDED PROTECTION, THE OWNER SHOULD STRONGLY CONSIDER INSTALLING 1 TO 3 INCHES OF ADDITIONAL GRAVEL UNDER THE PIPING.

4. AFTER THE INITIAL GRAVEL LAYER IS INSTALLED, INSTALL LEVEL DISTRIBUTION PIPING FOLLOWED BY 6 MORE INCHES OF GRAVEL (GRAVEL WILL BE AT LEAST 12" THICK; GRAVEL MUST BE AT LEAST 2 INCHES ABOVE THE PIPE AND LEVEL). ALL GRAVEL THAT IS NOT CLEAN WILL BE REJECTED BY THE ENGINEER AND SHALL BE REPLACED.

5. INSTALL APPROVED FILTER (MAX. 2 OZ. PER SQUARE YARD) FABRIC [BOWMAN CONSTRUCTION (303) 696-8960] OVER THE GRAVEL FIELD. THEN INSTALL AT LEAST 18 INCHES OF SOIL COVER AND NO MORE THAN 36 INCHES OF SOIL COVER OVER THE FILTER FABRIC PER COUNTY GUIDELINES TO MITIGATE FREEZING.

6. CREATE A MOUND OVER THE BED TO PREVENT SURFACE WATER PONDING AND FACILITATE RAIN WATER AND SNOW MELT RUN-OFF. WHEN A MOUND IS CREATED, USE 3:1 (3 FEET HORIZONTAL TO 1 FOOT VERTICAL) SIDE SLOPES ON THE MOUND BACKFILL. FINISH GRADING AROUND THE ENTIRE STA AREA MUST MITIGATE WATER AWAY FROM THE STA.

7. RESEED DISTURBED AREAS WITH NATIVE GRASSES AND WILD FLOWERS HAVING A SHALLOW ROOT SYSTEM TO PREVENT EROSION PROBLEMS. SIDE SLOPES OF MOUNDED STA'S SHOULD BE NETTED TO PREVENT EROSION. IF EROSION BEGINS IN ANY PART OF THE DISPOSAL SYSTEM, CONTACT US IMMEDIATELY (REFER TO GENERAL NOTES ON SHEET D0).

DESIGN & INSTALLATION NOTES

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

LITTLEHORN ENGINEERING, LLC
351 US HWY 285, #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757

"PEACE OF MIND THROUGH HOLISTIC DESIGN"

PROJECT NO.
2022-100742

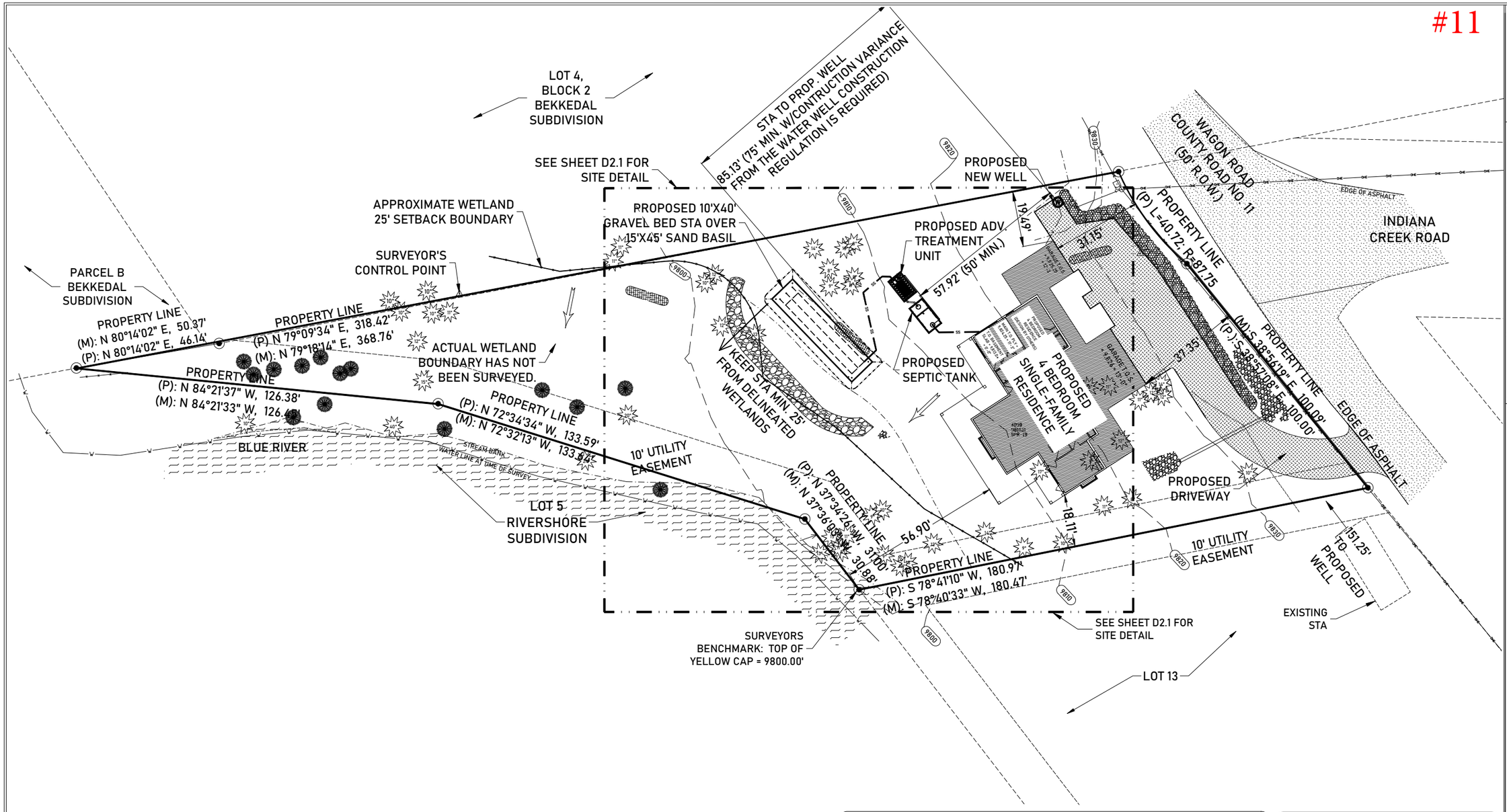
CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

D1

#11



PROPOSED OWTS SITE PLAN
PLOTTED AT 1" = 35'-0" (11x17)

WASTE DISPOSAL DESIGN ONLY. THIS IS NOT A SURVEY.

GENERAL NOTES:

1. HOUSE ENGINEERING IS BY OTHERS.
2. DRIVEWAY ENGINEERING IS BY LITTLEHORN, REFER TO SEPERATE CIVIL DWGS.
3. VERIFY ALL BUILDING SETBACKS AND BUILDING DESIGN PRIOR TO PLACING CONCRETE AND PRIOR TO OWTS INSTALLATION. VERIFICATION AND CONSTRUCTION STAKING SHOULD BE PERFORMED BY A LICENSED SURVEYOR.
4. ALL DISTURBED AREAS TO BE RE-VEGETATED WITH NATIVE WEED-FREE GRASS SEED.
5. SHORING AND JOB-SITE SAFETY IS THE RESPONSIBILITY OF OTHER QUALIFIED CONTRACTORS AND PERSONNEL.
6. DRAWING BASED ON SURVEY PERFORMED BY 'SCHMIDT LAND SURVEYING, INC.' ON JUNE 10, 2021.

LEGEND: SEE SHEET D0 FOR DRAWING ABBREVIATIONS

- (11100) EXISTING CONTOUR & LABEL
- (W) WELL HEAD
- PROPERTY CORNERS
- GRAVEL ROADWAY/DRIVE
- DRAINAGE ROUTE
- 3H:1V SLOPE OF GRADE
- —SS— SEWER LINE
- 1/D4 DETAIL # / PAGE #

LITTLEHORN ENGINEERING, LLC
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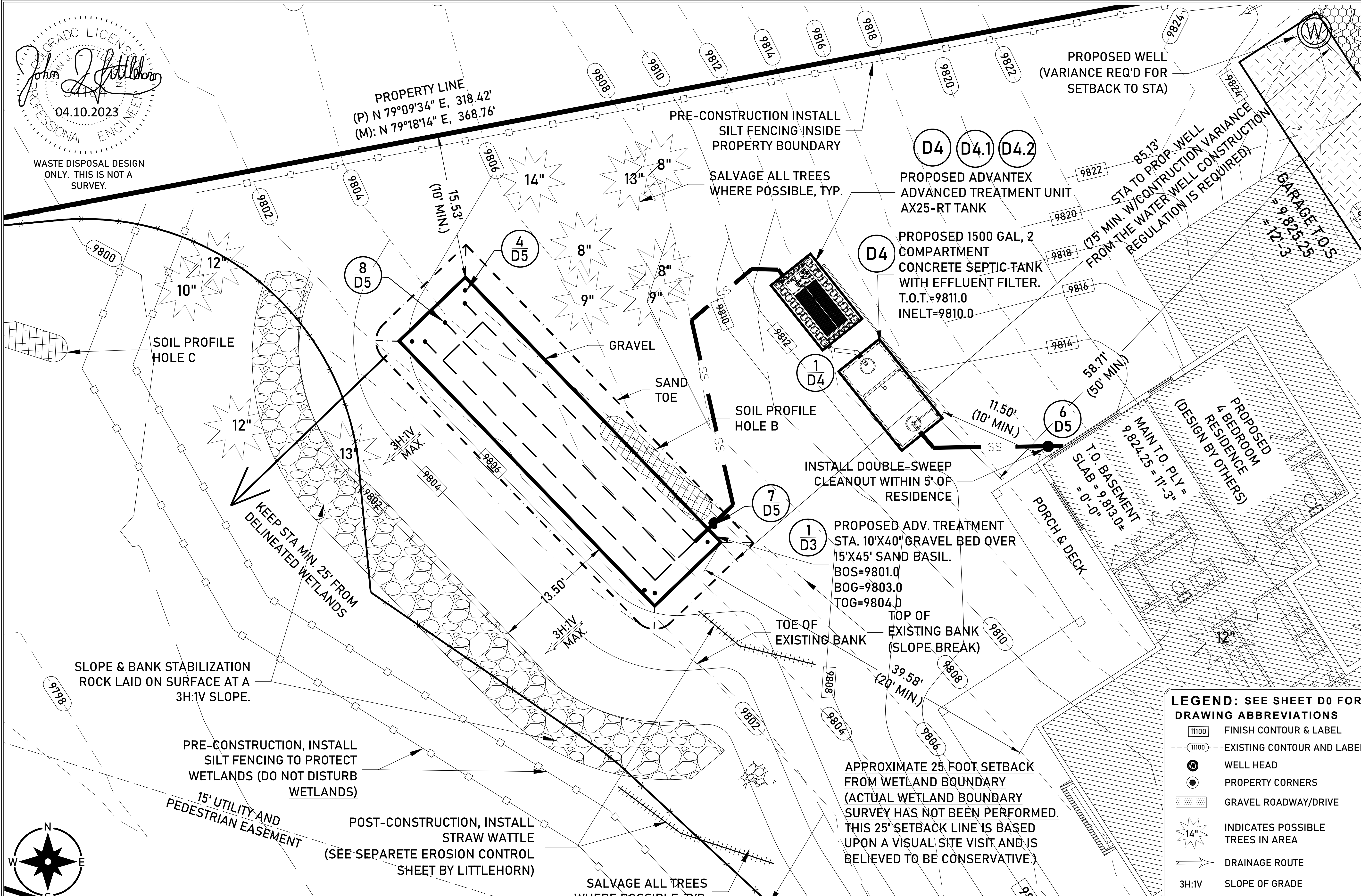
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757
"PEACE OF MIND THROUGH HOLISTIC DESIGN"

OVERALL SITE PLAN FOR OWTS
311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

PROJECT NO. 2022-100742
CLIENT LANDYN AND MICHELLE HACKEBEIL
DATE 04.10.2023
REVISION:
1 N/A
2 N/A
3 N/A

D2



COLORADO LICENSED PROFESSIONAL ENGINEER
04.10.2023
WASTE DISPOSAL DESIGN ONLY. THIS IS NOT A SURVEY.
PROPERTY LINE
(P) N 79°09'34" E, 318.42'
(M): N 79°18'14" E, 368.76'
PRE-CONSTRUCTION INSTALL SILT FENCING INSIDE PROPERTY BOUNDARY
SALVAGE ALL TREES WHERE POSSIBLE, TYP.
15.53' (10' MIN.)
PROPOSED WELL (VARIANCE REQ'D FOR SETBACK TO STA)
D4 D4.1 D4.2
PROPOSED ADVANTEX ADVANCED TREATMENT UNIT AX25-RT TANK
PROPOSED 1500 GAL, 2 COMPARTMENT CONCRETE SEPTIC TANK WITH EFFLUENT FILTER.
T.O.T.=9811.0
INELT=9810.0
85.13' STA TO PROP. WELL (75' MIN. W/CONTRUCTION VARIANCE FROM THE WATER WELL CONSTRUCTION REGULATION IS REQUIRED)
GARAGE T.O.S. = 9,825.25 = 12'-3"
SOIL PROFILE HOLE C
GRAVEL
SAND TOE
SOIL PROFILE HOLE B
58.71' (50' MIN.)
11.50' (10' MIN.)
INSTALL DOUBLE-SWEEP CLEANOUT WITHIN 5' OF RESIDENCE
PROPOSED 4 BEDROOM RESIDENCE (DESIGN BY OTHERS)
MAIN T.O. PLY = 9,824.25 = 11'-3"
T.O. BASEMENT SLAB = 9,813.0± = 0'-0"
PORCH & DECK
PROPOSED ADV. TREATMENT STA. 10'X40' GRAVEL BED OVER 15'X45' SAND BASIL.
BOS=9801.0
BOG=9803.0
TOG=9804.0
3H:1V MAX.
13.50'
KEEP STA MIN. 25' FROM DELINEATED WETLANDS
TOE OF EXISTING BANK
TOP OF EXISTING BANK (SLOPE BREAK)
39.58' (20' MIN.)
SLOPE & BANK STABILIZATION ROCK LAID ON SURFACE AT A 3H:1V SLOPE.
PRE-CONSTRUCTION, INSTALL SILT FENCING TO PROTECT WETLANDS (DO NOT DISTURB WETLANDS)
15' UTILITY AND PEDESTRIAN EASEMENT
POST-CONSTRUCTION, INSTALL STRAW WATTLE (SEE SEPARETE EROSION CONTROL SHEET BY LITTLEHORN)
SALVAGE ALL TREES WHERE POSSIBLE, TYP.
APPROXIMATE 25 FOOT SETBACK FROM WETLAND BOUNDARY (ACTUAL WETLAND BOUNDARY SURVEY HAS NOT BEEN PERFORMED. THIS 25' SETBACK LINE IS BASED UPON A VISUAL SITE VISIT AND IS BELIEVED TO BE CONSERVATIVE.)
LEGEND: SEE SHEET D0 FOR DRAWING ABBREVIATIONS
FINISH CONTOUR & LABEL
EXISTING CONTOUR AND LABEL
WELL HEAD
PROPERTY CORNERS
GRAVEL ROADWAY/DRIVE
INDICATES POSSIBLE TREES IN AREA
DRAINAGE ROUTE
3H:1V SLOPE OF GRADE
SEWER LINE
DETAIL # / PAGE #

PROPOSED OWTS SITE PLAN

PLOTTED AT 1" = 10'-0" (11x17)

#12

SITE PLAN DETAIL FOR OWTS

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

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CLIENT: LANDYN AND MICHELLE HACKEBEIL

DATE: 04.10.2023

REVISION: N/A, N/A, N/A

D2.1

#13

BUILDING SEWER AND WASTEWATER PIPING:

1. ALL PIPING JOINTS MUST BE WATERTIGHT, ROOT PROOF, AND LAID WITH THE FLARED ENDS IN THE PROPER DIRECTION.

2. ALL PIPING SHALL BE ADEQUATELY BEDDED WITH SAND, PEA GRAVEL, OR APPROVED EQUAL COMPACTED IN PLACE WITH A VIBRATORY-TYPE COMPACTOR TO PREVENT SETTLEMENT AND HAVE AT LEAST 18 INCHES OF SOIL COVER (i.e. MOUNDING IS PERMITTED WITH COMPACTED STRUCTURAL FILL PER NOTES ON SHEET D5) TO MITIGATE FREEZING; ALL PIPING LAID WITHIN 5 FEET AND BELOW A VEHICULAR TRAFFIC AREA SHALL HAVE A MINIMUM OF 3 FEET OF SOIL COVER UNLESS OTHERWISE APPROVED.

3. ALL BENDS IN ANY PART OF THE SEWER LINE GREATER THAN 45° SHALL BE LONG SWEEP ELBOWS.

4. ALL PIPING WHICH IS INSTALLED IN A VEHICULAR TRAFFIC AREA SHALL BE MINIMUM SCHEDULE 40 PVC PIPE OR EQUIVALENT. PIPING NOT WITHIN A VEHICULAR TRAFFIC AREA SHALL BE SDR35 OR BETTER U.N.O. IN THE SITE PLAN.

5. LAYING PIPE IN TRENCH. EVERY PRECAUTION SHALL BE TAKEN TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE DURING PLACEMENT. DURING LAYING OPERATIONS, NO DEBRIS, TOOLS, CLOTHING OR OTHER MATERIAL SHALL BE PLACED IN THE PIPE. SEE DETAILS AND SHEET D5 FOR BEDDING INSTRUCTIONS.

6. PIPING FROM THE RESIDENCE TO THE SEPTIC TANK: USE 4-INCH DIAMETER SCHEDULE 40 PVC PIPE, OR EQUIVALENT, LAID WITH A DOWNWARD SLOPE OF 2% TO 10% (1/4-INCH PER FOOT TO 1.2-INCH PER FOOT) EXCEPT FOR THE LAST 5 FEET WHERE THE SLOPE MUST NOT EXCEED 4%. IT IS BETTER TO LAY THIS PIPE AT A CONSTANT GRADE WITHOUT FLUCTUATIONS. IF A 2% TO 10% PERCENT GRADE CANNOT BE MAINTAINED AND STEP DOWNS ARE REQUIRED, USE 22 OR 45 DEGREE ELBOWS.

7. INSTALL 4-INCH CLEAN-OUTS:

   A. WITHIN 5 FEET OF THE RESIDENCE (USE A DOUBLE SWEEP CLEAN OUT HERE)

   B. AT INTERVALS OF 50 FEET OR LESS BETWEEN THE HOUSE AND TANK AND NO MORE THAN 50 FEET BETWEEN THE TANK AND THE STA. BE SURE TO USE INSULATED PRESSURIZED CAP DETAILS WHERE CLEAN-OUTS ARE INSTALLED ON A PRESSURIZED LINE.

   C. WHERE THE LINE BENDS AT ANGLES 45 DEGREES OR MORE.

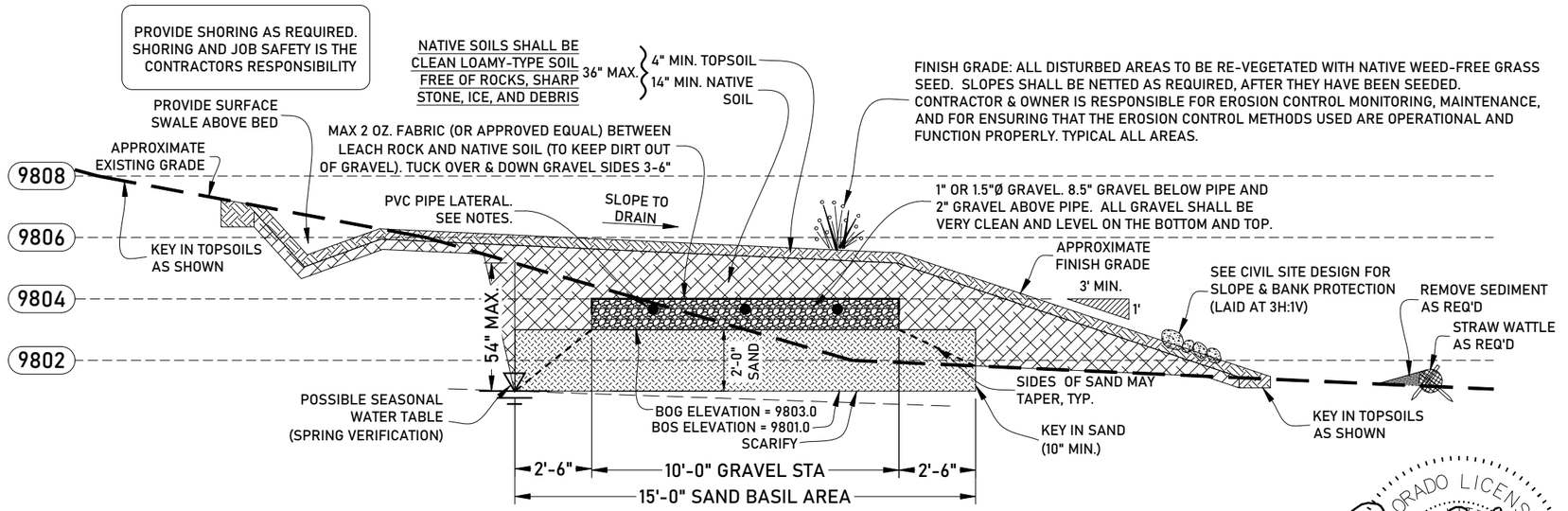
   D. USE TRAFFIC RATED RISERS WHERE REQUIRED.

8. FOR PIPING FROM THE SEPTIC TANK TO THE STA: USE 2-INCH DIAMETER SCHEDULE 40 PVC PIPE, LAID WITH A MINIMUM DOWNWARD SLOPE OF 2% TO ALLOW DRAINING OF THE PIPE AT THE END OF THE PUMP CYCLE. ACCORDINGLY, THE PIPE SHALL DRAIN EMPTY AT THE END OF THE PUMP CYCLE.

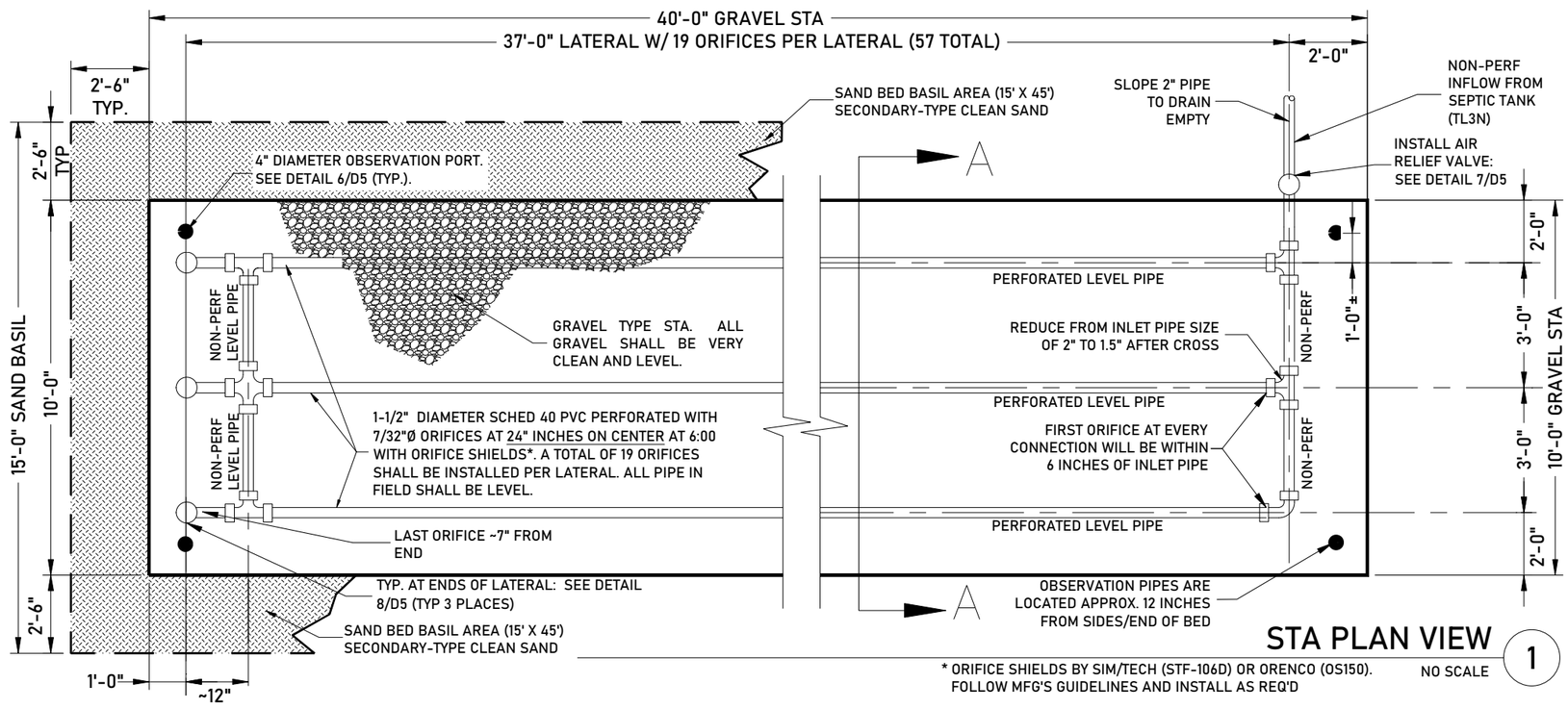
9. FOR PIPING IN THE STA, INSTALL 1.5"Ø PIPING, SCHED. 40 PVC, SET ON A LEVEL GRADE USING A BUILDER'S OR ENGINEER'S LEVEL INSTRUMENT WITH PERFORATIONS AS SHOWN.

10. NO PART OF THE SYSTEM CAN BE BACKFILLED PRIOR TO INSPECTION. IF ANY PART OF THE SYSTEM IS BACKFILLED WITHOUT THE APPROVAL OF THE ENGINEER AND THE COUNTY, BACKFILL WILL BE REQUIRED TO BE REMOVED FOR EXAMINATION AND PROPERLY RESTORED AT THE CONTRACTOR'S EXPENSE. IT IS THE CONTRACTORS RESPONSIBILITY TO BUILD THE SYSTEM IN COMPLIANCE WITH THE ENGINEERS SPECIFICATIONS, COUNTY REGULATIONS, AND STATE REGULATIONS, AS REQUIRED.

11. FOR BACKFILL, ALL PIPE SHALL BE INSTALLED AND BEDDED PROPERLY. THIS WILL REQUIRE MOISTURE TO BE APPLIED TO THE BACKFILL TO OBTAIN PROPER COMPACTION. REFER TO SHEET D5.



2 STA CROSS SECTION A-A
NO SCALE



STA PLAN VIEW
NO SCALE
1

* ORIFICE SHIELDS BY SIM/TECH (STF-106D) OR ORENCO (OS150). FOLLOW MFG'S GUIDELINES AND INSTALL AS REQ'D

COLORADO LICENSED JOHN J. LITTLEHORN 38704 PROFESSIONAL ENGINEER
04.10.2023

STA DETAILS AND NOTES

311 WAGON ROAD
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PROJECT NO.
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CLIENT
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DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

D3

#14

SEPTIC TANK:

1. THE PRIMARY SEPTIC TANK SHALL HAVE A MINIMUM HOLDING CAPACITY OF 1500 GALLONS IN THE FIRST TWO COMPARTMENTS (1509 GALLON TANK CAPACITY TOTAL). THIS TANK WILL SERVE AS PRIMARY TREATMENT AND ALL EFFLUENT DISCHARGED WILL ENTER THE ORENCO ADVANTEX AX25RT-(MODE 3B) ADVANCED TREATMENT UNIT.

2. ORENCO ADVANTEX AX25RT-(MODE 3B): EFFLUENT ENTERING THE ADVANCED TREATMENT UNIT (ORENCO ADVANTEX AX25RT) IS RECIRCULATED OVER A SERIES OF TEXTILE MEDIA UTILIZING A SELF-CONTAINED RECIRCULATION PUMP. NATURAL BACTERIA IN THE UNIT BECOME "FIXED" OR ATTACHED TO THE STATIONARY TEXTILE MEDIA. THIS IS WHERE THE ABUNDANT, DIVERSE, SELF-REGULATING POPULATION OF MICROBES CONSISTENTLY METABOLIZE THE RECIRCULATED WASTE. DUE TO THE NATURAL AEROBIC PROCESSES OCCURRING, A PASSIVE VENT IS ATTACHED TO THE UNIT. THE PASSIVE VENT MUST EXTEND ABOVE SNOWLINE. AN ADDITIONAL DISCHARGE PUMP IS USED TO PUMP THE TREATED WATER TO THE SOIL TREATMENT AREA. FOR THE DISCHARGE PUMP, USE AN ORENCO PUMP MODEL PF5005 HIGH HEAD EFFLUENT PUMP, 2-INCH DISCHARGE, 1/2 HP, 115V OR 230V [(719) 395-6764]. FOR THIS SYSTEM, THE PUMP IS DESIGNED FOR A FLOW RATE OF 68.4 GPM WITH A TOTAL DYNAMIC HEAD OF 25.9 FEET.

3. THE ORENCO EFFLUENT DISCHARGE PUMP SHALL BE EQUIPPED WITH A COLD WEATHER DISCHARGE ASSEMBLY WITHOUT CHECK VALVE. THE COLD WEATHER ASSEMBLY WILL ENABLE THE LINE TO EMPTY AT END OF PUMPING CYCLE. INSTALL CONTROL PANEL AND FLOATS FOR DEMAND DOSING PER MANUFACTURER REQUIREMENTS. A REDUNDANT UL LISTED FLOAT SHOULD BE INSTALLED TO ENSURE THE PUMP DOES NOT RUN DRY. THE FLOATS SHOULD BE SET FOR A 12-INCH DRAW DOWN TO DOSE THE FIELD WITH 121 GALLONS (PIPE DRAINS TO FIELD). INSTALL PUMP CONTROL PANEL WITH BOTH AUDIBLE AND VISUAL ALARM SIGNALS WITHIN THE INTERIOR OF THE HOME OR GARAGE IN A DRY AND SECURE PLACE. AN ELAPSED TIME METER AND COUNTER IS REQUIRED. THE INSTALLER SHALL PERFORM ALL ELECTRICAL WIRING IN ORDER TO AVOID THE HAZARDOUS AREA (REF. TO COUNTY REGULATIONS). NON-METALLIC PVC OR THREADED RIGID METAL CONDUIT WILL BE REQUIRED BETWEEN THE JUNCTION BOX WITHIN THE TANK AND THE ELECTRICAL EQUIPMENT OUTSIDE OF THE TANK. CONDUIT SEALS SHALL BE USED WHEN ENTERING OR LEAVING THE ELECTRICAL CONTROL BOX. BE SURE THE HIGH WATER ALARM AND PUMP ARE CONNECTED TO SEPARATE CONTROL BREAKERS

4. THE TANK SHALL BE WATERPROOFED AND INSULATED WITH AT LEAST 2 INCHES OF RIGID FOAM BOARD APPROVED FOR BELOW GROUND USE OR EQUAL. FOAM BOARD SHALL BE INSTALLED ON TOP OF TANK AND ALONG THE SIDES AT LEAST 2 FEET FROM THE TOP. AT LEAST 1" OF RIGID FOAM BOARD WILL BE ATTACHED TO THE INSIDE TOP LID OF THE AX25-RT UNIT. DO NOT PLACE THE BOTTOM OF THE TANK DEEPER THAN 72 INCHES BELOW THE EXISTING SURFACE OR THE TANK MAY FLOAT IN A HIGH WATER TABLE EVENT.

5. THE DISCONNECT/CONTROL EQUIPMENT ENCLOSURE MUST BE WEATHERPROOF.

6. THE EFFLUENT PUMPING SYSTEM AND CONTROL PANEL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL STATE AND LOCAL REGULATIONS. THE PUMP SHALL BE PRIMED PROPERLY PRIOR TO START-UP.

7. THE SEPTIC TANK SHALL BE A WATERTIGHT PRECAST CONCRETE (EQUIPPED WITH LIFTING RINGS) VAULT MEETING ASTM C1227-13. THE TANK SHALL HAVE TWO COMPARTMENTS SEPARATED BY INTEGRAL OR SEPARATELY CAST WALLS, KEYED INTO THE SIDES OF THE TANK. THE TANK SHALL CONFORM TO SUMMIT COUNTY REGULATIONS. IN PART THESE REGULATIONS STATE THE FOLLOWING: A) THE FIRST COMPARTMENT SHALL HAVE THE SPECIFIED MINIMUM LIQUID CAPACITY. B) THE LIQUID DEPTH IN THE TANK SHALL BE NO LESS THAN 30". C) FREE VENTILATION BETWEEN COMPARTMENTS SHALL BE PROVIDED IMMEDIATELY BELOW THE VAULT CEILING. D) AN INLET TEE OR BAFFLE SHALL BE PROVIDED AND SHALL EXTEND ABOVE THE SURFACE OF THE LIQUID AT LEAST 5" AND SHALL EXTEND A MINIMUM OF 8" BELOW THE LIQUID SURFACE. E) BAFFLE SYSTEMS SHALL BE PROVIDED TO DISSIPATE ENERGY AND PREVENT SHORT CIRCUITING FLOW THROUGH THE COMPARTMENTS (35 TO 40% OF THE LIQUID DEPTH). F) THE INLET INVERT SHALL BE AT LEAST 2" ABOVE THE OUTLET INVERT. J) THE BAFFLES SHALL EXTENT TO 14" BELOW THE OUTLET INVERT. I) THE SEPTIC TANK AND EQUIPMENT AND MATERIALS WITHIN THE TANK SHALL BE MANUFACTURED FROM DURABLE AND CHEMICALLY RESISTANT MATERIALS WHICH ARE UNAFFECTED BY GASES AND FLUIDS ASSOCIATED WITH DOMESTIC SEWAGE.

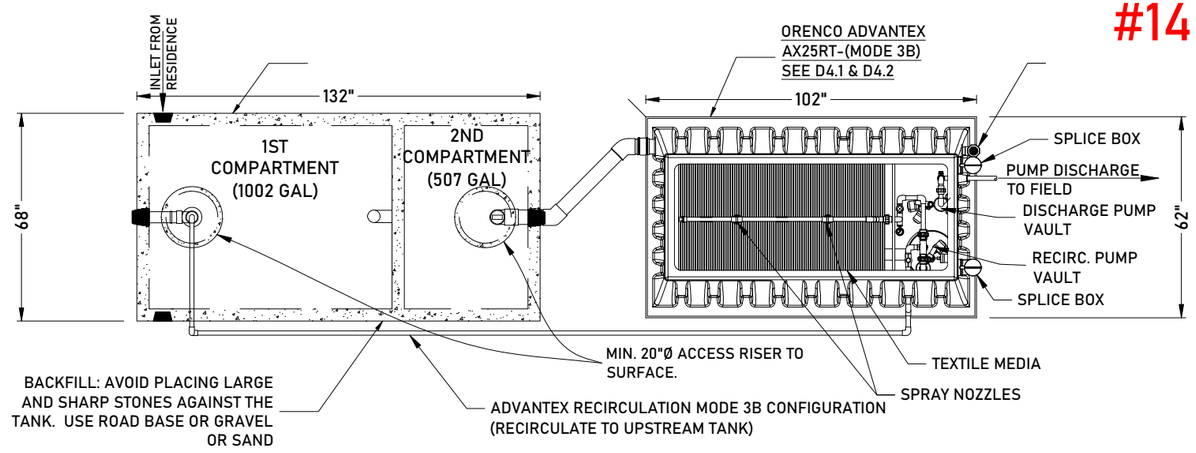
8. ACCESS RISERS: ACCESS OPENINGS WITH A MINIMUM DIMENSION OF 20 INCHES SHALL BE PROVIDED OVER EACH COMPARTMENT WITH THE EXCEPTION OF THE DOSING COMPARTMENT, WHERE A 24"Ø RISER IS REQUIRED. CONCRETE, PVC OR FIBERGLASS RISERS WITH SECURE CLOSING MECHANISMS OR OF SUFFICIENT WEIGHT SHALL BE PROVIDED OVER EACH ACCESS OPENING AS NECESSARY TO PROVIDE ACCESS FROM FINISH GRADE. RISERS SHALL BE ATTACHED TO THE TANKS SUCH THAT A WATERTIGHT SEAL IS PROVIDED; MECHANICAL FASTENERS ARE RECOMMENDED TO AUGMENT THE SAFETY (& SEAL) OF POSITIVE CLOSURE OF THE LID. TO MITIGATE FREEZING, AT LEAST 18-INCH TALL RISERS SHALL BE USED. TANK HEATERS ARE A MUST IN PART-TIME SYSTEMS & WHEN THE TANK IS MORE THAN 50 FEET FROM THE HOUSE. USE TRAFFIC RATED LIDS WHERE REQUIRED.

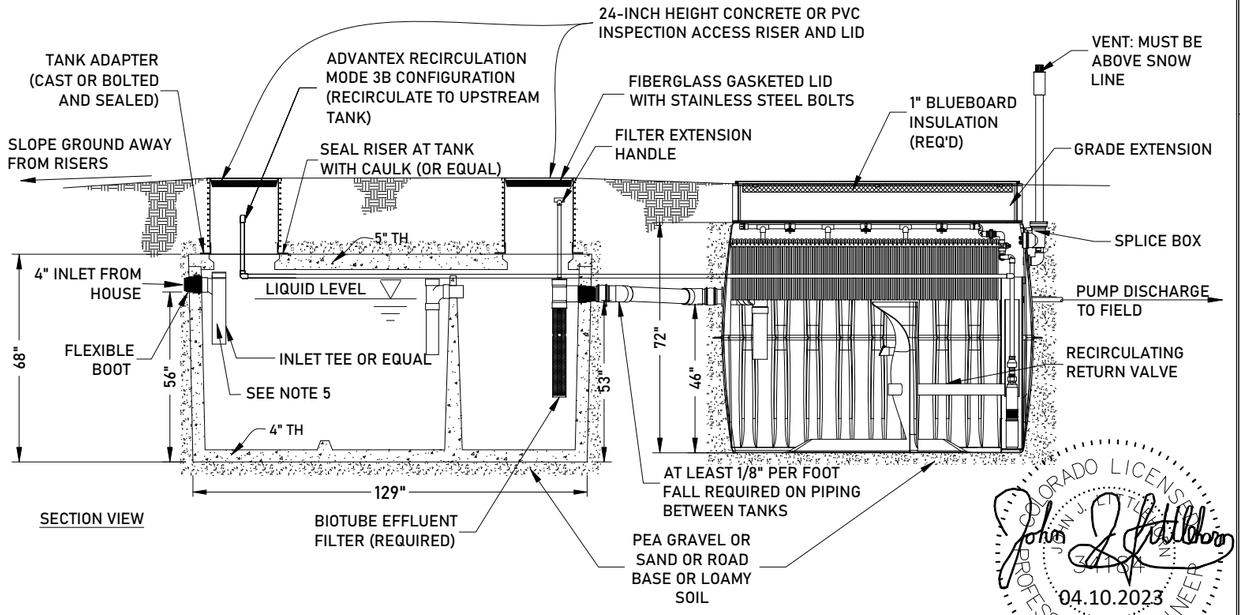
9. TANK SUB-GRADE/WATERPROOFING: THE TANK SHALL BE INSTALLED ON A LEVEL SUBGRADE OF UNDISTURBED SOIL OR WELL COMPACTED BACKFILL CAPABLE OF SUPPORTING A 2000 PSF LOAD (TESTING IS HIGHLY RECOMMENDED IF YOU'RE NOT SURE). THE TANK SHALL BE BACKFILLED WITH SUITABLE GRANULAR SOIL (FREE OF CLAY, ORGANIC MATTER, COBBLES, SNOW,OR ICE), SAND, PEA GRAVEL, OR SQUEEGEE. IN AREAS OF HIGH GROUND WATER, THE TANK SHOULD BE PROTECTED BY APPLYING A HEAVY CEMENT-BASE WATERPROOF COATING IN COMPLIANCE WITH TANK MANUFACTURER.

10. DRAINAGE: ROOF DRAINS, FOUNDATION DRAINS, AREA DRAINS, AND SPRINKLER HEADS MUST BE DIRECTED AWAY FROM THE SEPTIC TANK. MAKE SURE ALL AREAS AROUND THE TANK ARE GRADED TO MITIGATE GROUND WATER AWAY FROM THE TANK LIDS TO PREVENT WATER INFILTRATION INTO THE TANK.

11. PIPING: FOR THE INFLOW LINE, SET THE TANK AT A DEPTH THAT PERMITS GRAVITY INFLOW AS SPECIFIED. ALL PIPING SHALL BE ADEQUATELY SUPPORTED ON COMPACTED SELECT BACKFILL TO PREVENT FAILURE FROM DIFFERENTIAL SETTLEMENT. BACKFILLING AROUND THE SEPTIC TANK SHALL BE ACCOMPLISHED IN A MANNER THAT PREVENTS SETTLEMENT AND AVOIDS UNDUE STRAIN ON THE PIPES ENTERING AND EXITING THE SEPTIC TANK.

12. GENERAL: NO STRUCTURE SHALL BE CONSTRUCTED OVER ANY PORTION OF THE SEPTIC TANK. FOR INSTALLATION IN TRAFFIC AREAS, THE TANK SHALL BE DESIGNED TO WITHSTAND AN AASHTO H20-44 WHEEL LOAD + THE EQUIVALENT SOIL WEIGHT ON THE TANK + A 30 PSF FLUID UNIT SIDE WALL PRESSURE. ALL TANKS MUST BE WATERTIGHT.





MANUFACTURER NOTES*:

- ORENCO ADVANTEX AX25RT INSTALLATION TO BE PERFORMED BY AN ADVANTEX TRAINED INSTALLER ONLY.
- ORENCO ADVANTEX AX25RT START-UP AND SERVICE TO BE PERFORMED BY AN ADVANTEX TRAINED SERVICE PROVIDER ONLY.
- TANK TO BE SET ON 5" MIN. SAND BED OR PEA GRAVEL
- TANK TO BE BACKFILLED UNIFORMLY ON ALL SIDES IN LIFTS LESS THAN 24" AND MECHANICALLY COMPACTED
- EXCAVATION SHOULD BE DEWATERED
- FILL TANK WITH CLEAN WATER PRIOR TO BEING PUT IN SERVICE WHEN WATER TABLE IS WITHIN 24" OF TANK TOP.

*SEE INSTALLATION GUIDE ON WEBSITE

	TOTAL CAPACITY	APPROXIMATE WEIGHTS		
PRIMARY TANK	1509 GALLONS	TANK 11,180 LBS	TOTAL 14,780 LBS	LID 3,600 LBS

1 SEPTIC TANK DETAILS

NO SCALE

FOR THIS PROJECT, A VALLEY PRECAST TANK IS SPECIFIED (719-395-6764). IF A DIFFERENT TANK MFG IS CHOSEN BY THE CONTRACTOR, SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

GENERAL OWTS DESIGN ONLY. NO TANK STUCTURALS.

SEPTIC TANK DETAILS & SPECIFICATIONS

311 WAGON ROAD
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351 US HWY 285, #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757

"PEACE OF MIND THROUGH HOLISTIC DESIGN"

COLORADO LICENSED
JOHN J. LITTLEHORN
34104
PROFESSIONAL ENGINEER
04.10.2023

PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

D4

AdvanTex® O&M MANUAL
SUPPLEMENTAL INFORMATION, AX-RT

Introduction: AdvanTex® AX-RT Treatment Unit Operation

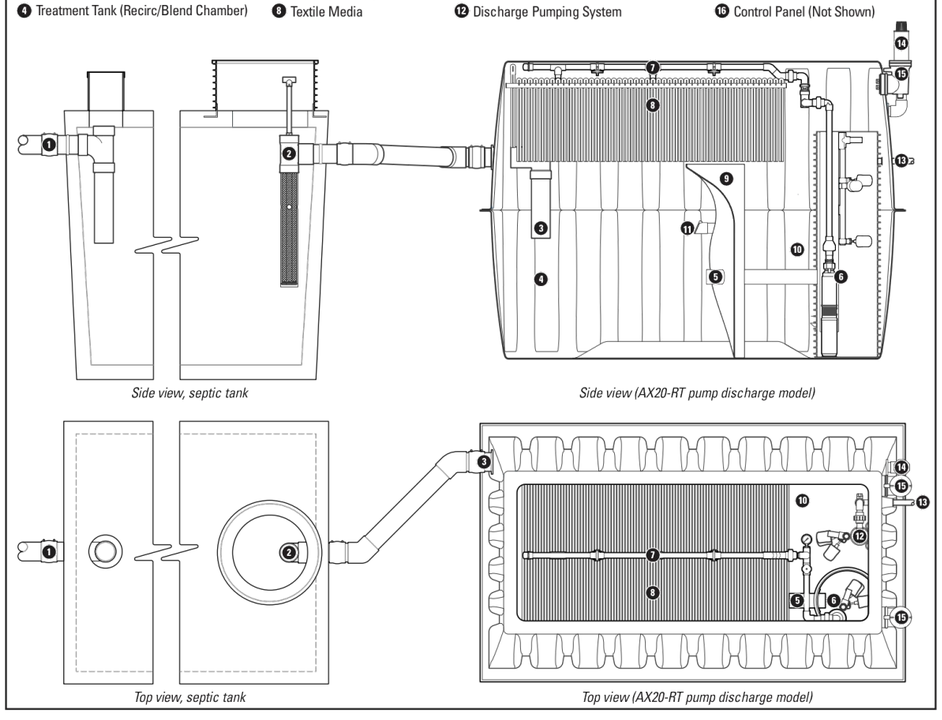
This supplement contains information to help you successfully operate and maintain an AdvanTex® AX-RT Treatment System. The AX-RT operates similarly to the AdvanTex AX20 Treatment System, but there are some differences to be aware of when performing O&M activities. A big difference is that the AX-RT consists of a single, self-contained module for recirculation, treatment, and dosing, instead of separate units.

Another difference is that the AX-RT has no Recirculating Splitter Valve (RSV). Effluent percolates down through the textile media and is split — by means of a tank baffle — between the recirc/blend chamber and the recirc/filtrate chambers of the AX-RT recirculating treatment tank.

Raw sewage enters the septic tank through its inlet tee. In the septic tank, the raw sewage separates into three distinct zones — a scum layer, a sludge layer, and a clear zone. Effluent from the clear layer passes through a Biotube® effluent filter and is discharged by gravity to the recirc/blend chamber of the AX-RT unit. The effluent then flows through the recirc transfer line to the recirc pumping system. The recirc pumping system pumps effluent from the recirc/blend chamber through the manifold to the spray nozzles in the top of the unit. Effluent percolates down through the textile media and is divided — by means of a tank baffle — between the recirc/blend chamber and the recirc/filtrate chamber inside of the unit.

Figure 1. AdvanTex® AX-RT Functional Areas and Components (AX20-RT Shown):

1. Septic Tank Inlet Tee
2. Biotube® Effluent Filter
3. AX-RT Inlet and Tee
4. Treatment Tank (Recirc/Blend Chamber)
5. Recirc Transfer Line
6. Recirc Pumping System
7. Manifold and Spin Nozzles
8. Textile Media
9. Tank Baffle
10. Treatment Tank (Recirc/Filtrate Chamber)
11. Recirc-Return Valve
12. Discharge Pumping System
13. AX-RT Outlet
14. Passive Air Vent
15. External Splice Box
16. Control Panel (Not Shown)



Side view, septic tank

Side view (AX20-RT pump discharge model)

Top view, septic tank

Top view (AX20-RT pump discharge model)

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AdvanTex® O&M MANUAL
SUPPLEMENTAL INFORMATION, AX-RT

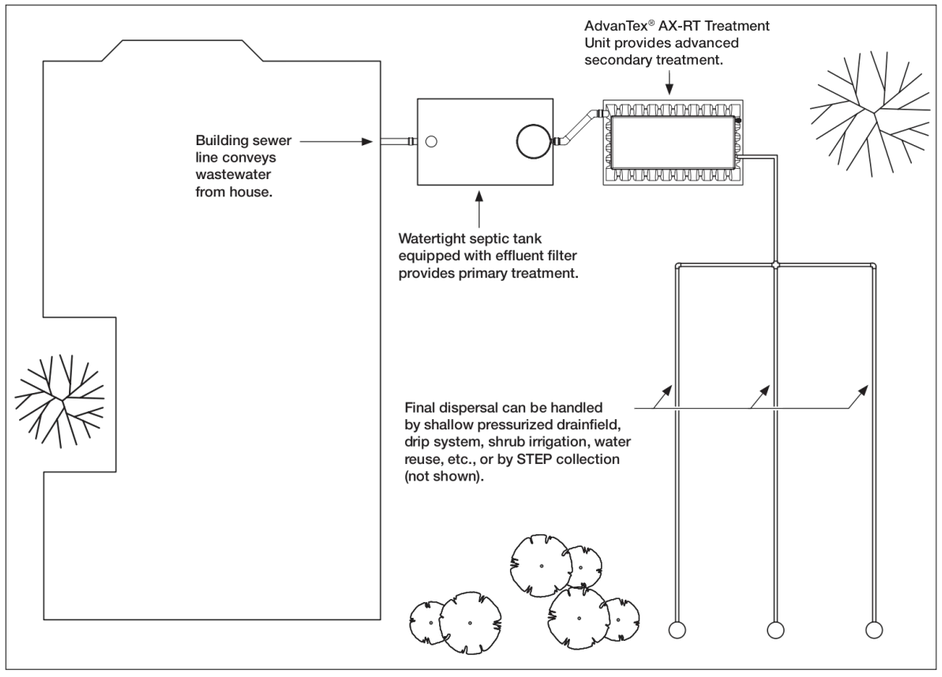
#15

Introduction to AdvanTex AX-RT, continued

The recirc pump's operation is controlled by a timer in the control panel. It allows the pump to dose the textile media for short periods (usually 0.8 to 1.0 minutes), typically 72 times a day. These frequent "micro-doses," which optimize the treatment process, occur 24 hours a day, to maintain the proper biological environment.

Treated effluent can be discharged to the drainfield by means of a discharge pump system or by gravity discharge. The "High Level Alarm" and "ON" floats for the discharge pump are set at the factory and are non-adjustable. Dose volume for the discharge pump system is determined by adjustments to the "OFF" float. AX-RT units with gravity discharge simply discharge when the level of treated effluent in the recirc/filtrate chamber is at the level of the discharge outlet. For units equipped with UV disinfection, the effluent passes through the UV treatment unit before being pumped or flowing by gravity to final dispersal.

Typical Site Plan for an AdvanTex AX-RT Treatment Unit



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THIS DRAWING IS PROVIDED FOR ILLUSTRATION AND ADVANTEX UNIT SPECIFICATIONS ONLY. REFER TO SHEET D4 FOR THE FULL CONFIGURATION WITH PRIMARY TANK. ORENCO ADVANTEX AX25RT INSTALLATION TO BE PERFORMED BY AN ADVANTEX TRAINED INSTALLER ONLY. ALL SERVICE AND MAINTENCE ON ORENCO TO BE PERFORMED BY AN ADVANTEX TRAINED SERVICE PROVIDER ONLY.

ORENCO ADVANTEX AX-RT MFG. DRAWING 1 OF 2

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351 US HWY 285 #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757

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D4.1

AdvanTex O&M Manual: Changes Specific to the AX-RT

The following shows AX-RT-specific information not found in Parts 1 and 2 of the *AdvanTex® O&M Manual* that are relevant to operating and maintaining the AdvanTex AX-RT Treatment Unit. Use the general information found in the *O&M Manual* along with this information to start up and properly service AX-RT systems.

Start-Up Checklist Changes

Primary Treatment

Note: *All pumping equipment is contained in the AX-RT unit. Substitute the checklist item below for the checklist items in the "Process Tank Pumping Equipment" and "Process Tank Pumping System" sections.*

Septic Tank

☐ Biotube® filter installed correctly on the septic tank outlet.

Note: *There is no recirculating splitter valve (RSV) or separate discharge basin in an AX-RT system. Floats in the recirculation pump system are set at the factory for correct performance. Do not adjust the floats in the recirculation pump system. Substitute the checklist items below for the checklist items in the "Secondary Treatment" section.*

Secondary Treatment

AX-RT Unit

☐ AX-RT unit installed level.

☐ All piping properly covered and compacted.

Ventilation System

☐ Passive air vent on AX-RT unit properly installed.

Recirculation Pump System

☐ Floats operate properly.

☐ Pump plumbing connected correctly to manifold.

Recirculation Pump System Operation

☐ Pump operates in "Manual."

☐ Pump operates in "Automatic."

☐ Pump run amps:_____

☐ Pump rest volts:_____ run volts:_____

AX-RT Filter Operation

☐ Complete, square spray square pattern with full coverage of sheets

AX-RT Discharge Unit (pump discharge only)

☐ Floats operate properly.

☐ Pump discharge plumbing connected correctly.

☐ "Off" float adjusted for correct discharge dose to dispersal.

Setting Timers for New Systems

Initial timer settings for an AX-RT should be established based upon expected average daily flows and a recirculation ratio of 4:1 (filter recirculation ratio). Table 1 provides recommended timer settings. If flows vary significantly from expected flows, timer settings should be adjusted accordingly. Contact Orenco for more information.

Table 1. Recommended Timer Settings for New Systems

Models AX20-RT, AX20-RTUV	Number of Residents	Time On Setting Min (Sec)	Avg Daily Flow, gpd (L/day)	Time Off Setting Min
	2	0.8 (48)	100 (379)	36.1
	3	0.8 (48)	150 (568)	23.8
	4	0.8 (48)	200 (757)	17.6
	5	0.8 (48)	250 (946)	13.9
	6	0.8 (48)	300 (1136)	11.5
	7	0.8 (48)	350 (1325)	9.7
	8	0.8 (48)	400 (1514)	8.4
Model AX25-RT	**Number of Residents**	**Time On Setting Min (Sec)**	**Avg Daily Flow, gpd (L/day)**	**Time Off Setting Min**
	2	0.7 (42)	100 (379)	47.7
	3	0.7 (42)	150 (568)	31.6
	4	0.7 (42)	200 (757)	23.5
	5	0.7 (42)	250 (946)	18.7
	6	0.7 (42)	300 (1136)	15.4
	7	0.7 (42)	350 (1325)	13.1
	8	0.7 (42)	400 (1514)	11.4
	9	0.7 (42)	450 (1703)	10.1
	10	0.7 (42)	500 (1893)	9.0
	11	0.7 (42)	550 (2082)	8.1
	12	0.7 (42)	600 (2271)	7.4

- *Assumes water usage of 50 gal. (190 L) per person per day and a return recirculation ratio of 3:1. (Filter recirculation ratio of 4:1.)*
- *Override OFF cycle time is set at one-half of the OFF cycle time. Override ON cycle time is set the same as the ON cycle time.*

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AdvanTex® O&M MANUAL
SUPPLEMENTAL INFORMATION, AX-RT

Setting Discharge Dose Volume

The AX-RT is pre-set at the factory for a discharge dose volume of 43 gal/dose (162 L/dose). If necessary, use the discharge pump "Off" float to make adjustments to the discharge dose volume. Each 1-in. (25 mm) increase or decrease in "Off" float height is equal to approximately 8.7 gal. (33 L) change in dose volume.

Do not adjust the settings of the "High-Level Alarm" and "On" floats.

Table 2. Dose Volume Information

Pump gal./min (L/sec)	10 (0.6)	20 (1.3)	30 (1.9)	50 (3.2)
Factory float setting*, in. (mm)	30 (762)	30 (762)	30 (762)	30 (762)
Lowest "Off" setting, in. (mm)	16 (406)	18 (457)	20 (508)	24 (610)
Max dose volume, gal. (L)	156 (591)	139 (526)	123 (466)	90 (341)

**Settings are measured from the bottom of the discharge side of the AX-RT unit.*

Perform Field Sampling

When you arrive at the site, remove the lid from the AX-RT and take your sample from the recirc/filtrate side of the AX-RT unit before doing anything else, so that the sample won't be contaminated by material that you stir up while working.

When you collect effluent samples, be careful not to touch the textile sheets, unit walls, or other components. Disturbing the sheets, walls, or other components could contaminate the samples. Also, be sure to thoroughly clean and dry your sampling device between uses to avoid cross-contamination.

Measure Sludge and Scum

Measure sludge and scum in the septic tank AND on the recirc/blend side of the AX-RT unit. Follow the instructions for pumpouts found in the *AdvanTex O&M Manual* for the process tank.

NOTE: *A light buildup of solids is expected to form in the AX-RT unit over time. After the second year that the system is in use, we recommend measuring solids accumulation in the AX-RT whenever you perform regularly scheduled maintenance.*

If more than trace amounts of scum or solids are found in the recirc/blend side of the AX-RT unit, check the recirc/filtrate side of the unit for solids and scum, schedule a pumpout, and begin troubleshooting the system. The Advanced Service Tips and Troubleshooting Guide can help you determine the cause. You may need to change timer settings or discuss household habits with the system users.

Notes

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ORENCO ADVANTEX AX-RT MFG. DRAWING 2 OF 2

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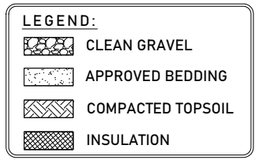
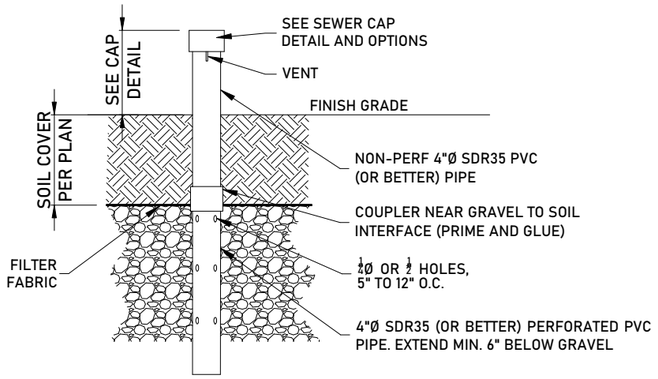
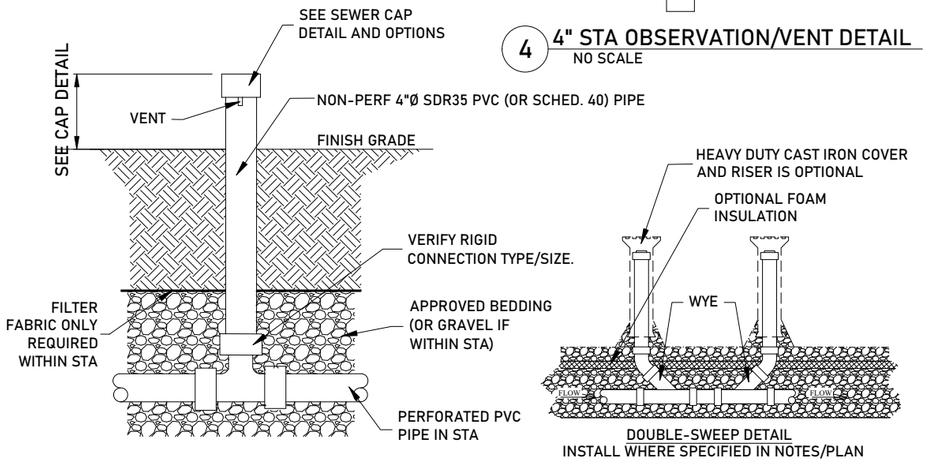




4 4" STA OBSERVATION/VENT DETAIL
NO SCALE



5 4" OBSERVATION/VENT PIPE DETAIL
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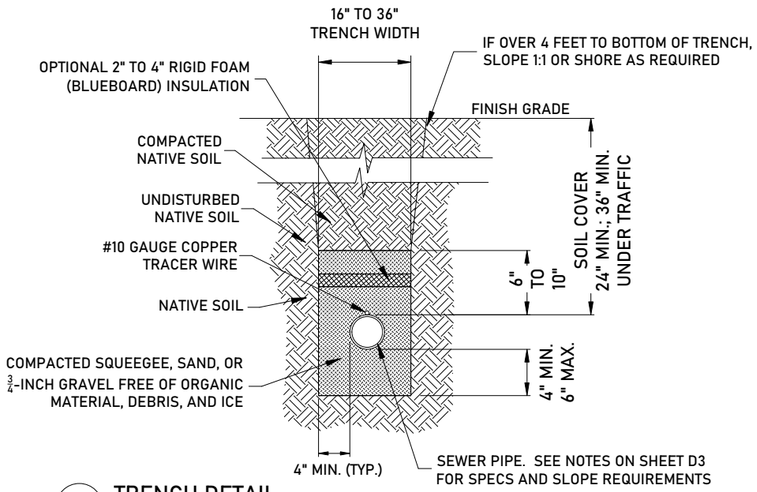
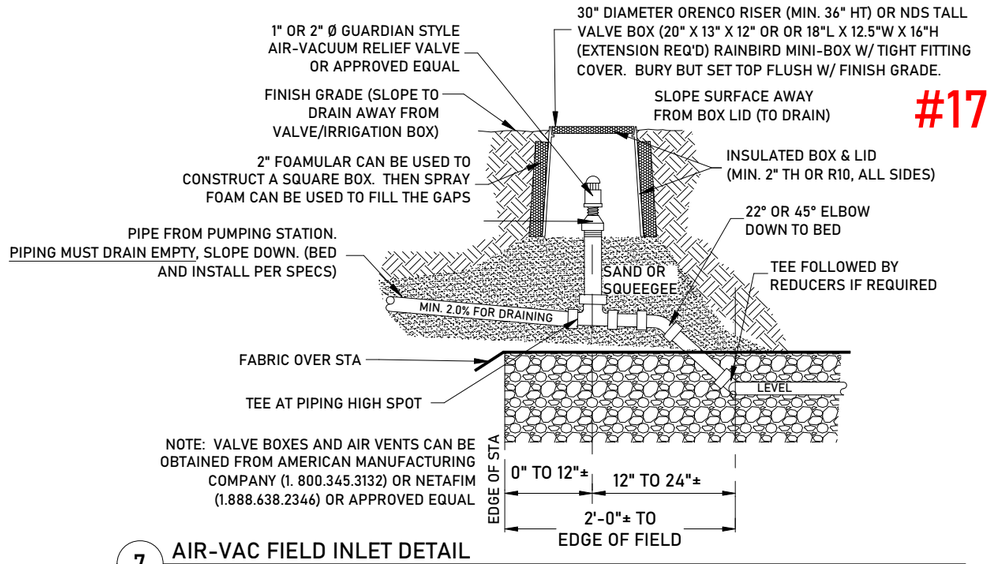
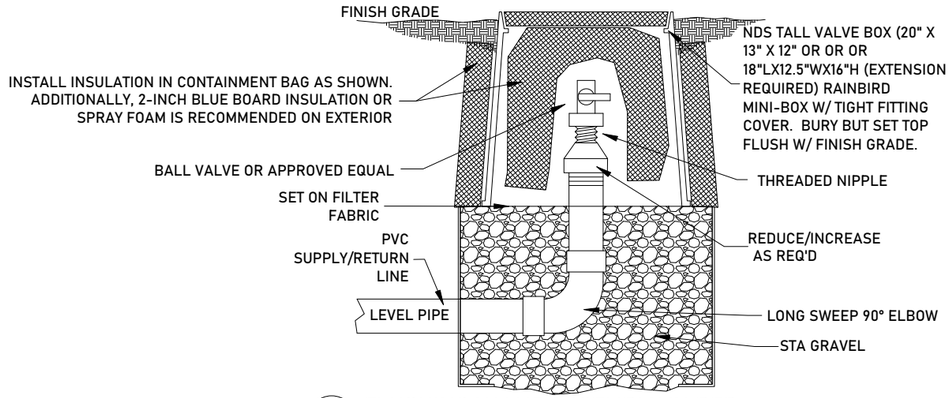


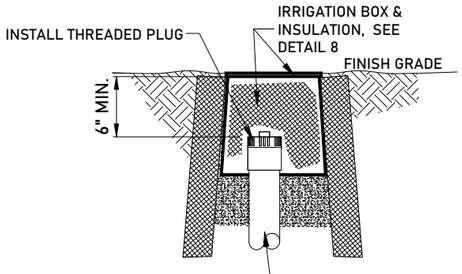
6 TRENCH DETAIL
NO SCALE



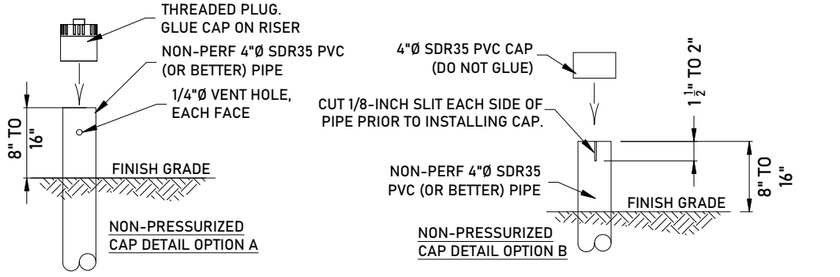
7 AIR-VAC FIELD INLET DETAIL
NO SCALE



8 FLUSHING VALVE ASSEMBLY IN BED
NO SCALE



PRESSURED CAP DETAIL



OPTION A AND B NOT PERMITTED FOR PRESSURIZED SYSTEMS

9 SEWER CAP DETAIL & OPTIONS
NO SCALE

WHEN PORT IS WITHIN PRESSURIZED PIPE SYSTEM, USE PRESSURIZED CAP DETAIL.

OWTS DETAILS & EXCAVATION NOTES

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D5

IMPORTANT

SAVE

TO BE GIVEN TO PROPERTY TENANTS (POST IN MECH. ROOM)

1. AN OPERATION AND MAINTENANCE CONTRACT IS REQUIRED FOR ALL ADVANCED TREATMENT SYSTEMS. THIS ENTAILS HAVING A QUALIFIED SERVICE PROVIDER (NAWT O&M 2 CERTIFIED OR EQUAL) MAINTAIN AND INSPECT THE SYSTEM ROUTINELY. IN GENERAL, MAINTENANCE SHALL BE PERFORMED EVERY SIX (6) MONTHS FOR HIGHER LEVEL TREATMENT SYSTEMS. THE COUNTY MAY AMEND OPERATION PERMITS TO REDUCE OR INCREASE THE MAINTENANCE FREQUENCY BASED ON THE INFORMATION CONTAINED IN THE REQUIRED INSPECTION REPORTS.

2. SYSTEMS WHICH ARE ABUSED BY IMPROPER USE AND NOT PROPERLY MAINTAINED WILL FAIL AND CAN FREEZE DURING THE COLD SEASON.

3. IT IS THE PROPERTY OWNER'S RESPONSIBILITY TO USE THE SYSTEM CORRECTLY, OBSERVE THE OPERATION OF THE SYSTEM, AND TO PERFORM REGULAR MINOR MAINTENANCE TO ALLOW FOR PROPER, LONG-TERM FUNCTIONING OF THE DISPOSAL SYSTEM.

4. HAVE YOUR SYSTEM INSPECTED BY A QUALIFIED INSPECTOR OR CONTRACTOR AT LEAST ONCE EVERY TWO YEARS.

5. AN OPERATION AND MAINTENANCE CONTRACT WITH AN ON-SITE WASTEWATER COMPANY IS REQUIRED TO ENSURE PROPER OPERATION AND LONGEVITY.

6. DO NOT DRIVE OR PARK OVER YOUR SEPTIC TANK OR ANY PART OF YOUR ABSORPTION FIELD. THIS CAN COMPACT THE SOIL AND CRUSH YOUR SYSTEM RENDERING IT INOPERABLE. TRAFFIC BARRIERS SHOULD BE INSTALLED AROUND THE PERIMETER OF THE ABSORPTION FIELD AND SEPTIC TANK.

7. PRACTICE WATER CONSERVATION.

8. REPAIR DRIPPING FAUCETS AND LEAKING TOILETS AND USE WATER-SAVING FEATURES IN SHOWER HEADS, FAUCETS, AND TOILETS. LARGE GATHERINGS WILL OVERLOAD THE SYSTEM SINCE SEVERAL PEOPLE MAY BE USING THE SYSTEM IN A SHORT PERIOD OF TIME. FAILURE TO PROPERLY CONSERVE WATER MAY DAMAGE YOUR SEPTIC SYSTEM OR CAUSE COMPLETE FAILURE.

9. TOILET SEALS SHOULD BE REPLACED AS NEEDED OR EVERY 3 YEARS.

10. SEPTIC TANKS CONTAIN HARMFUL, HAZARDOUS GASES. ONLY QUALIFIED PERSONNEL SHOULD ENTER THE SEPTIC TANK IF REQUIRED WITH AN APPROPRIATE AIR SUPPLY.

11. STA OR LEACH FIELD AREAS MUST BE KEPT FREE OF ASPEN TREES, SHRUBS, OR ANY PLANT SPECIES HAVING A DEEP ROOT SYSTEM. DISTURBED AREAS SHOULD BE RE-SEEDED WITH NATIVE GRASSES HAVING A SHALLOW ROOT SYSTEM. MONITOR SOIL EROSION AROUND THE OSWTS.

12. FREEZING CAN OCCUR DURING PERIODS OF STARTUP, WHEN THE SYSTEM IS USED ON A PART TIME BASIS, AND DURING THE WINTER. IN THE DESIGN DRAWINGS WE HAVE SPECIFIED A MINIMAL SOIL COVER. SIX INCHES TO 12 INCHES OF ADDITIONAL SOIL COVER OVER THE ENTIRE SYSTEM CAN HELP TO MITIGATE FREEZING HOWEVER THE BEST OPTION TO MITIGATE FREEZING IS TO INSTALL A SEPTIC HEATER (MODEL A100 OR T100) [719.395.6764] AT THE TANK AND RISER AT THE STA. IN LIEU OF THE HEATER A 115 VOLT SUBMERSIBLE FLOATING TANK HEATER CAN BE USED (BUT IS NOT AS EFFECTIVE AND MAY BE ILLEGAL IF NOT PROPERLY INSTALLED) IN EACH COMPARTMENT OF THE SEPTIC TANK(S) BUT THESE TANK HEATERS WILL NOT MITIGATE LEACH FIELD FREEZING.

13. IF YOU PLAN TO INSTALL A JACUZZI, HOT TUB, THERAPEUTIC OR RECREATIONAL BATHING FACILITY, THIS OFFICE SHALL BE NOTIFIED TO INCLUDE THIS PROVISION IN THE DESIGN OF THE SYSTEM. DO NOT CONNECT THESE ITEMS TO THE SYSTEM WITHOUT CONSULTING WITH US TO PREVENT PERMANENT DAMAGE OR COMPLETE FAILURE.

14. BE AWARE OF YOUR ENVIRONMENT. REPORT ANY SURFACE WATER SEEPING OUT OF THE SOIL THAT HAS AN ODOR.

15. USE PHOSPHATE-FREE OR LOW PHOSPHATE AUTOMATIC DISH WASHING DETERGENTS.

16. NOTIFY THE ENGINEER OF ANY UNUSUAL CONDITIONS AS SOON AS THEY ARE DISCOVERED.

17. CONTACT THE ENGINEER OR THE COUNTY HEALTH DEPARTMENT FOR ANY HEALTH RELATED QUESTIONS AND FOR ANY QUESTIONS ABOUT THE INSTALLATION OR MAINTENANCE OF THE SEPTIC SYSTEM.

COLORADO LICENSED JOHN J. LITTLEHORN 38104 PROFESSIONAL ENGINEER
04.10.2023

GENERAL OWTS DESIGN ONLY.

ADVANTEX® HOMEOWNER'S MANUAL

AXN SUPPLEMENT

Your home includes a reliable, carefully engineered AdvanTex®-AXN Treatment System for the collection and treatment of residential wastewater. This AdvanTex-AXN Treatment System has been evaluated by the National Sanitation Foundation (NSF) and has been certified by NSF to meet the requirements of NSF-ANSI Standard 40 for Class I Systems.

Your AdvanTex-AXN Treatment System can effectively treat household-strength waste. And it can recycle precious water resources because the treated effluent can be returned harmlessly to the soil, where it receives final polishing and filtration for groundwater recharge.

Your AdvanTex-AXN Treatment System comes with an initial, two-year service contract, which includes regular testing and servicing after system start-up by an authorized AdvanTex Service Provider. All testing and servicing activities are to be performed three to six months after start-up; and an annual field-service inspection, including sampling, is to be scheduled in late spring or in early summer, with a minimum of four inspections during the first two years and annual inspections thereafter. For a complete description of those services, consult your service contract. An extended service contract is also available. Consult your AdvanTex-AXN Treatment System Dealer or Service Provider for a complete description of those services.

Many people are responsible for the care and maintenance of your AdvanTex-AXN Treatment System:

Homeowner's Responsibilities – Homeowners and other system users are responsible for preventive maintenance. You need to know what can go into the wastewater treatment system and what cannot. Read and practice the "Do's and Don'ts" in your Homeowner's Manual and instruct all system users to do the same.

Also, you need to know what to do in the event a problem arises or service is required:

- First, call your authorized Service Provider. Your Service Provider's name and phone number are on the back page of your Homeowner's Manual.
- If you cannot reach your Service Provider, call your authorized AdvanTex Dealer. Your AdvanTex Dealer's name and phone number are on the back page of your Homeowner's Manual.
- If you cannot reach either your Service Provider or your AdvanTex Dealer, call the manufacturer: Orenco Systems®, Inc., at **800-348-9843**. (You'll also find the manufacturer's name and address on the System Data Plate affixed to the inside of the filter pod.)

Finally, ask for and retain copies of all maintenance and service calls on your system.

Service Provider's Responsibilities – Authorized AdvanTex Service Providers are responsible for regular testing and servicing of your system, as spelled out in your initial service contract. Service Providers are also responsible for alarm response, in the event of a problem.

In addition, Service Providers should be present at system installation (so that they are familiar with your individual system, especially the location of service lines, conduits, and connections that get buried), and at system start-up.

Manufacturer's Responsibilities – Orenco Systems is responsible for training authorized AdvanTex Dealers and providing Dealers with training materials for authorized AdvanTex Service Providers. As long as the system is serviced in accordance with the initial service contract by an authorized AdvanTex Service Provider, Orenco Systems® will replace or repair any AdvanTex Treatment System components that fail because of defects in workmanship or materials.

One last note: If your AdvanTex-AXN Treatment System is used intermittently or if extended periods of non-use are anticipated, no special action needs to be taken. That's one of the advantages of the AdvanTex technology. Within the first day of operation after start-up or after extended periods of non-use, AdvanTex units achieve treatment removal efficiencies of 80% or greater. The system may be left running even during periods of vacancy, as the electrical consumption is negligible and the unit will continue to break down organic and inorganic wastewater constituents, even when the system isn't continually loaded. Nevertheless, it is always good practice to periodically observe your system and verify that it is functioning and that the effluent quality is consistent with the expectations described in your O&M manual.

With your preventive maintenance and with regular maintenance by an authorized Service Provider, your AdvanTex-AXN Treatment System should function for decades, providing better wastewater treatment than many municipal systems, without degradation to rivers and oceans. Congratulations, again, for making an environmentally sound investment.

Congratulations!

Orenco Systems®
Incorporated

Changing the Way the World Does Wastewater®

800-348-9843
www.orenco.com

ABR-OM-2
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Orenco Systems®, Inc.

OWTS MAINTENANCE REQUIREMENTS

#18

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

LITTLEHORN ENGINEERING, LLC
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 US HWY 285, #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757

PROJECT NO.
2022-100742

CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

D6

LITTLEHORN ENGINEERING, LLC
205 FOURTH STREET, SILVER CLIFF, CO 81252
(719) 836-7120 – FAIRPLAY (719) 783-3757 - SILVER CLIFF

Sieve Test Results - Profile Hole B

Project Number:	2022-37729	Property Information	
Date of Testing:	25-Oct-22	311 Wagon Road	
Client:	Hackebeil	Blue River, CO (Summit County)	

Soil Classification:

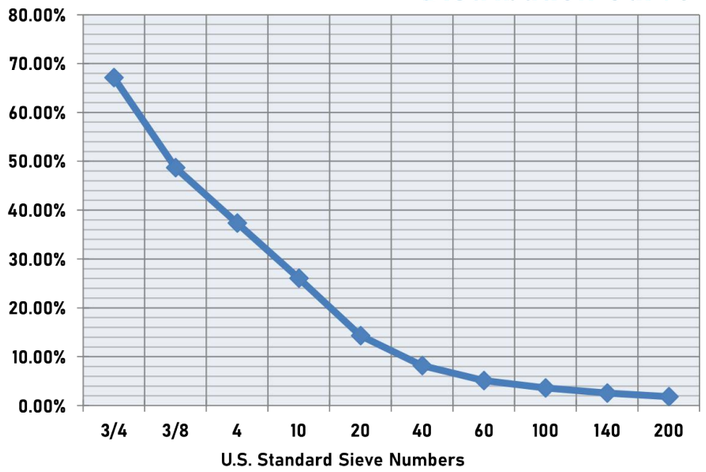
Soil Group - Poorly graded gravel with sand (GP)

Soil Type:

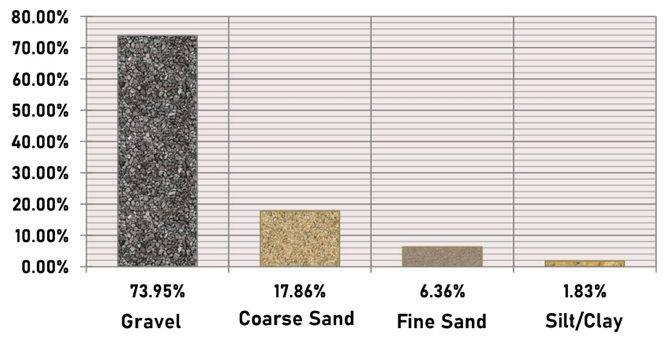
LTAR Soils Type - Sandy Loam (R2/2A)

Moisture Content: 4.16%

Typical Grain Size Distribution Curve



AASHTO Classification By Particle Size



Uniformity Coefficient (Cu): 6.15

Curvature Coefficient (Cc): 4.72

Pump Selection for a Pressurized System - Single Family Residence Project

HACKEBEIL / 2022-100742

#19

Parameters

Discharge Assembly Size	2.00	inches
Transport Length	33	feet
Transport Pipe Class	40	
Transport Line Size	2.00	inches
Distributing Valve Model	None	
Max Elevation Lift	5	feet
Manifold Length	6	feet
Manifold Pipe Class	40	
Manifold Pipe Size	2.00	inches
Number of Laterals per Cell	3	
Lateral Length	37	feet
Lateral Pipe Class	40	
Lateral Pipe Size	1.50	inches
Orifice Size	7/32	inches
Orifice Spacing	2	feet
Residual Head	4	feet
Flow Meter	None	inches
'Add-on' Friction Losses	4.6	feet

Calculations

Minimum Flow Rate per Orifice	1.19	gpm
Number of Orifices per Zone	57	
Total Flow Rate per Zone	68.4	gpm
Number of Laterals per Zone	3	
% Flow Differential 1st/Last Orifice	4.7	%
Transport Velocity	6.6	fps

Frictional Head Losses

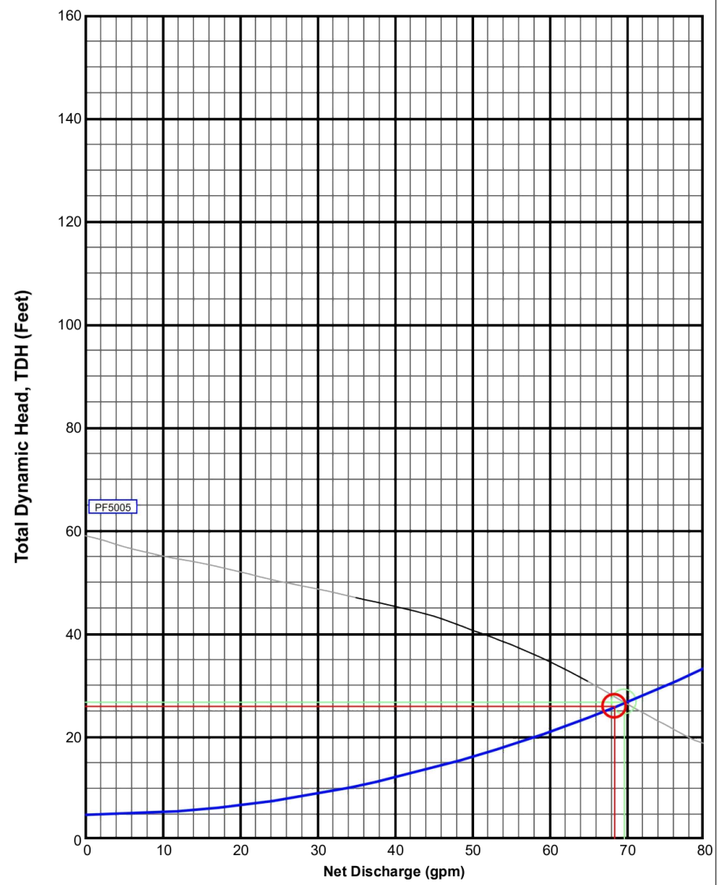
Loss through Discharge	9.4	feet
Loss in Transport	2.4	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.1	feet
Loss in Laterals	0.4	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	4.6	feet

Pipe Volumes

Vol of Transport Line	5.8	gals
Vol of Manifold	1.0	gals
Vol of Laterals per Zone	11.7	gals
Total Volume	18.5	gals

Minimum Pump Requirements

Design Flow Rate	68.4	gpm
Total Dynamic Head	25.9	feet



PumpData

PF5005 High Head Effluent Pump
50 GPM, 1/2HP
115/230V 1Ø 60Hz, 200/230V 3Ø 60Hz

Legend

System Curve:
Pump Curve:
Pump Optimal Range:
Operating Point:
Design Point:

COLORADO LICENSED
JOHN J. LITTLEHORN
PROFESSIONAL ENGINEER
04.10.2023

Orenco SYSTEMS
PROTECTING THE WORLD'S WATER

SOILS TESTING & PUMP CALCULATIONS

311 WAGON ROAD
TOWN OF BLUE RIVER, CO
SPILLWAY SUB #1, LOT 14

LITTLEHORN ENGINEERING, LLC
"PEACE OF MIND THROUGH HOLISTIC DESIGN"
351 US HWY 285, #201
FAIRPLAY, CO 80440
FAIRPLAY OFFICE 719.836.7120
SILVER CLIFF OFFICE 719.783.3757

PROJECT NO.
2022-100742

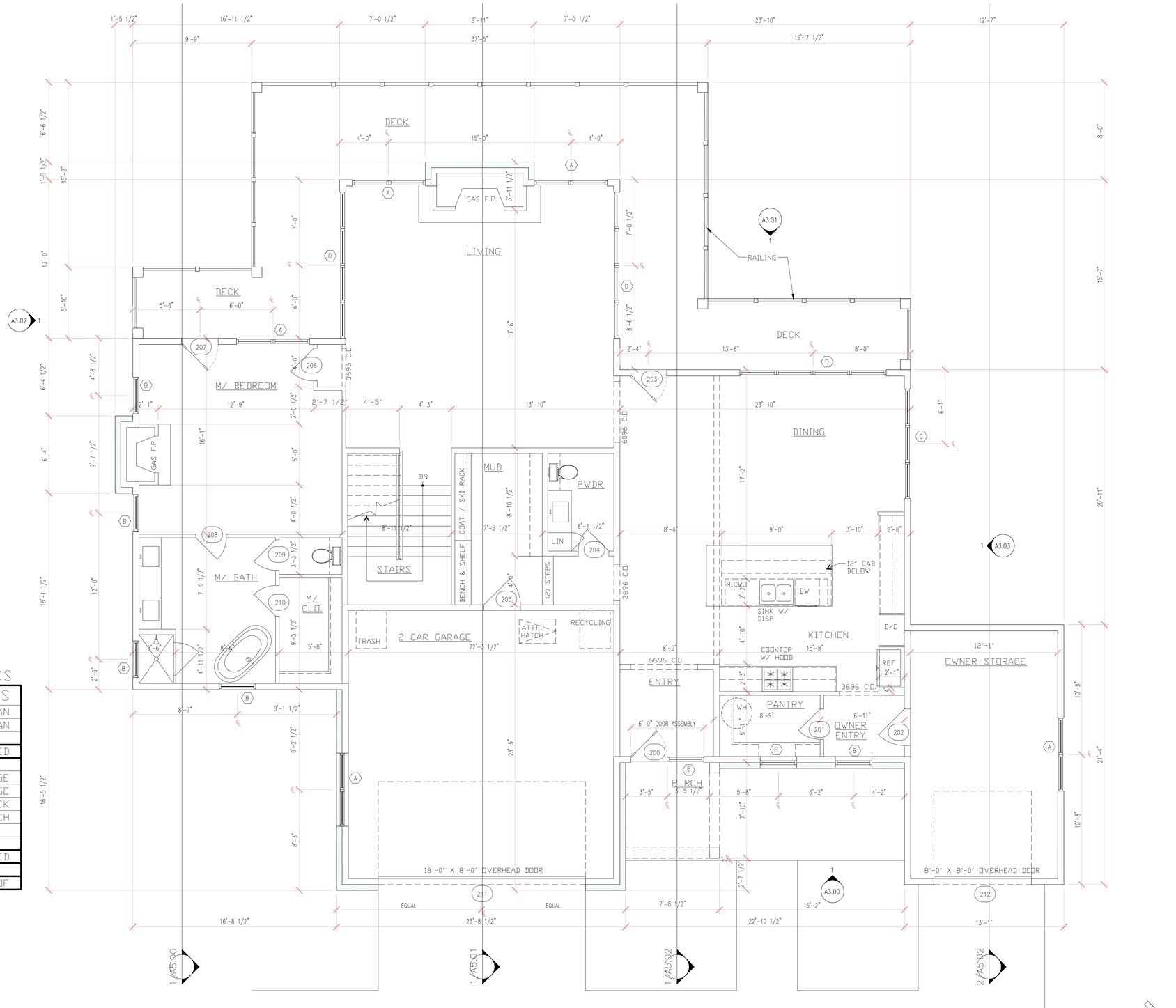
CLIENT
LANDYN AND MICHELLE HACKEBEIL

DATE
04.10.2023

REVISION:
1 N/A
2 N/A
3 N/A

D7

#20



1 FLOOR PLAN – UPPER LEVEL
1/4" = 1'-0"

SQUARE FOOTAGE CALCS

SF	AREAS
1967	UPPER LEVEL FLOOR PLAN
1744	LOWER LEVEL FLOOR PLAN
3711	TOTAL CONDITIONED
508	2-CAR GARAGE
274	1-CAR GARAGE
664	2ND FLOOR DECK
187	PORCH
5447	
1633	TOTAL UNCONDITIONED
	TOTAL UNDER ROOF

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BLUE RIVER MOUNTAIN HOME

311 WAGON ROAD

BLUE RIVER , COLORADO 80424

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TIMOTHY PAUL ROSE
00406141
ARCHITECT
04.10.23

PROJECT NUMBER	22066

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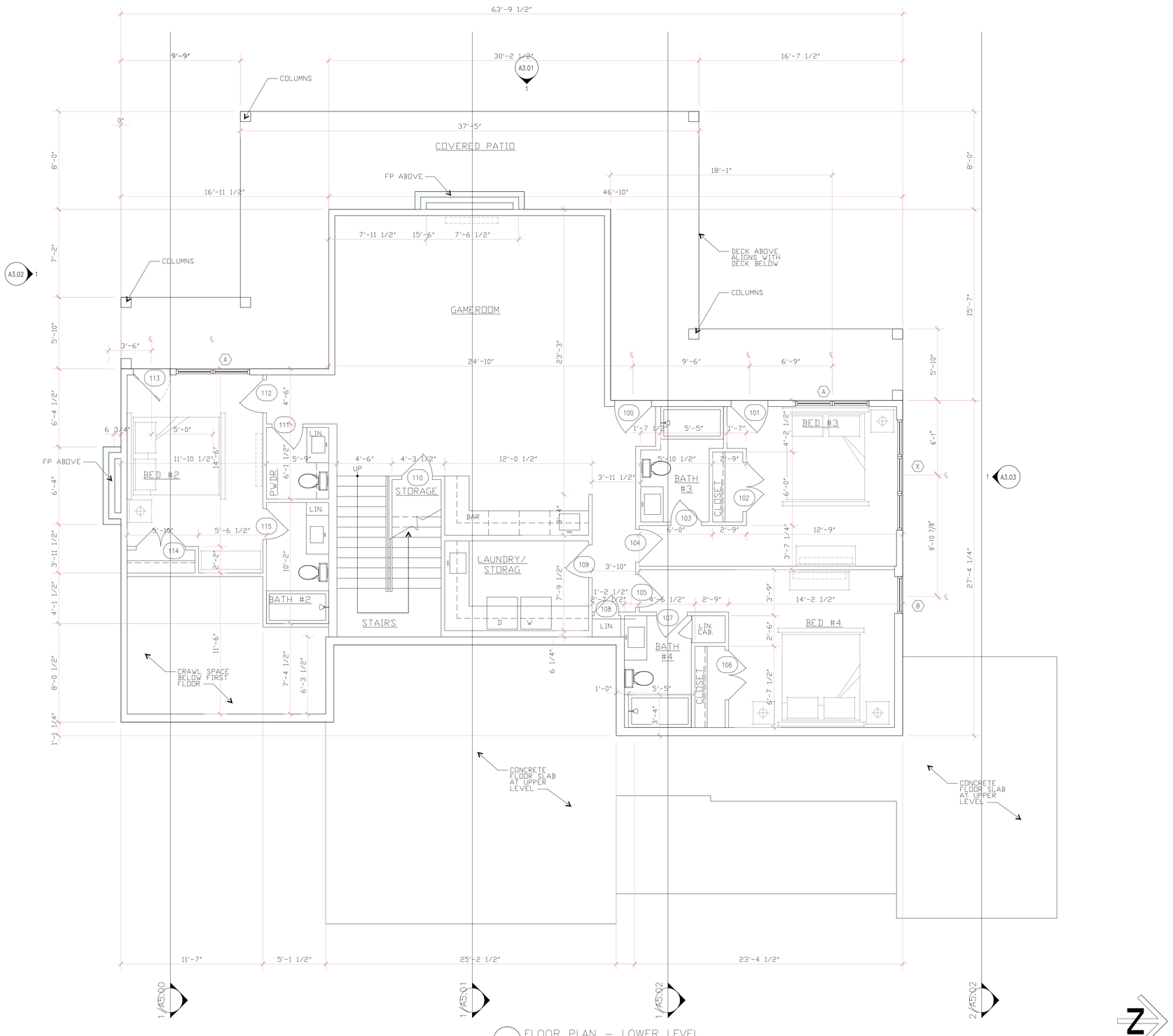
FOR PERMIT

A2.00

FLOOR PLAN UPPER LEVEL

#21



1 FLOOR PLAN – LOWER LEVEL
1/4" = 1'-0"

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A2.01

FLOOR PLAN LOWER LEVEL

#22

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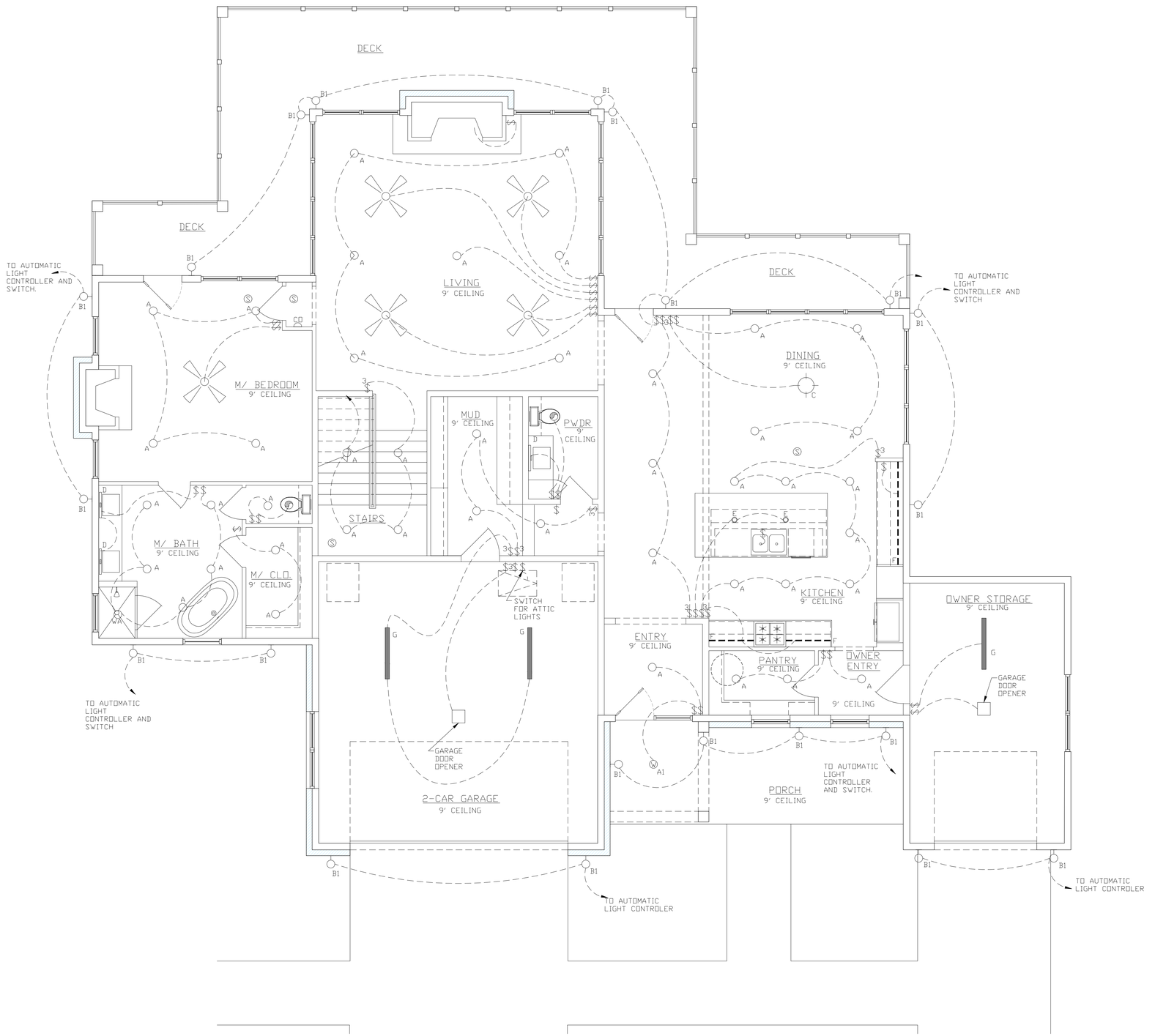

1 REFLECTIVE CEILING PLAN – UPPER LEVEL
1/4" = 1'-0"

REFLECTED CEILING LEGEND

DEVICE	DESCRIPTION	TYPE
Ⓢ	SMOKE DETECTOR	--
⊘	EXHUAST FAN	--
	CEILING FAN	--
○	RECESSED CAN LIGHT	A
Ⓦ	RECESSED CAN LIGHT - WET LOCATION	A1
	SCONCE LIGHT EXTERIOR	B1
	SCONCE LIGHT INTERIOR	B2
	CHANDELIER	C
▭	WALL MOUNTED VANITY LIGHT	D
○	PENDANT LIGHTS	E
▬	LED UNDER CABINET LIGHTS	F
⌓	CARBON MONOXIDE DETECTOR	CO
▬	LED LIGHT	G

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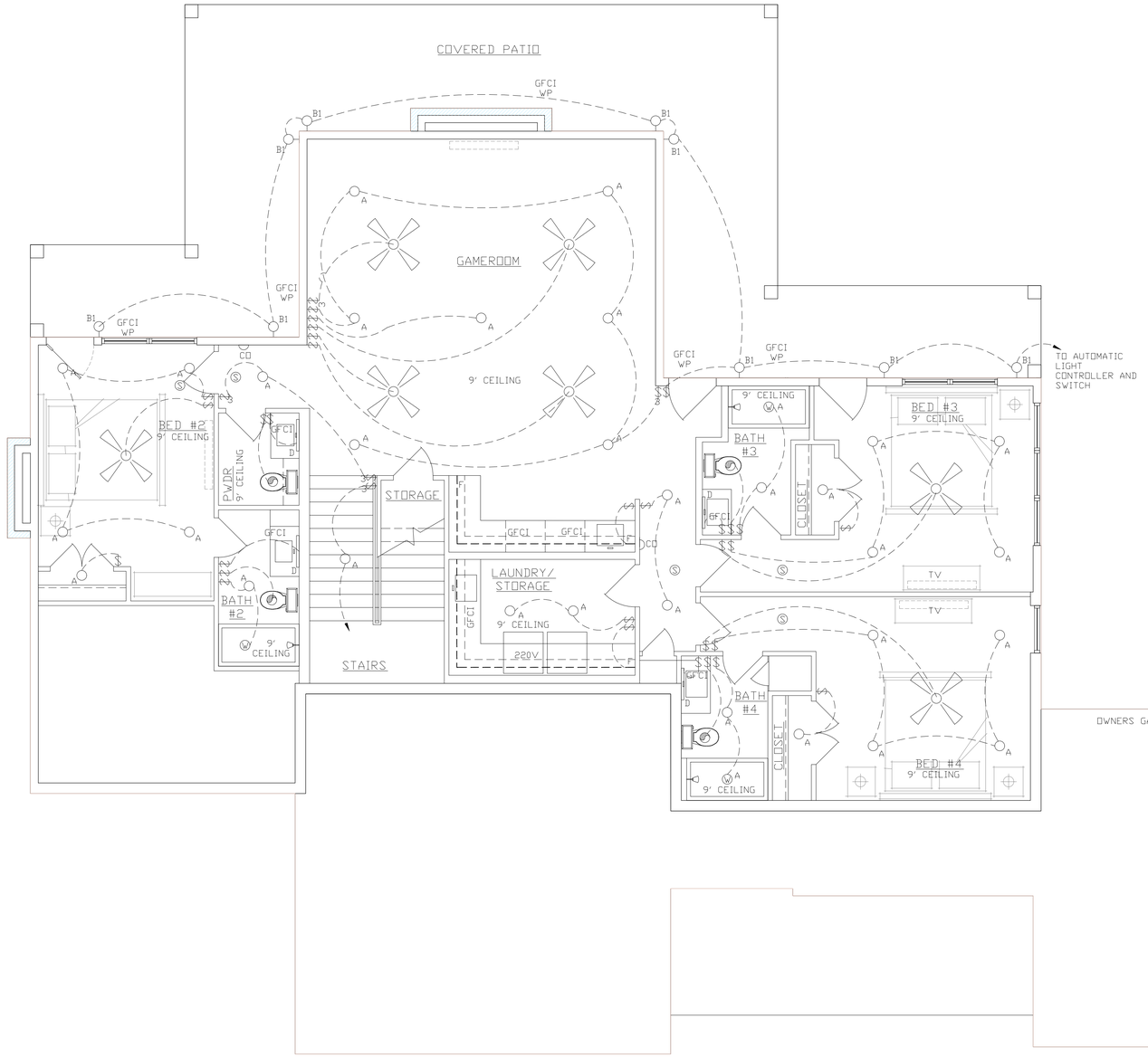
A2.02

RCP PLAN UPPER LEVEL

#23

REFLECTED CEILING LEGEND

DEVICE	DESCRIPTION	TYPE
Ⓢ	SMOKE DETECTOR	--
⊘	EXHUAST FAN	--
	CEILING FAN	--
○	RECESSED CAN LIGHT	A
Ⓦ	RECESSED CAN LIGHT - WET LOCATION	A1
	SCONCE LIGHT EXTERIOR	B1
	SCONCE LIGHT INTERIOR	B2
	CHANDELIER	C
▭	WALL MOUNTED LIGHT	D
○	PENDANT LIGHTS	E
- - - -	LED UNDER CABINET LIGHTS	F
◡	CARBON MONOXIDE DETECTOR	CO



1 REFLECTED CEILING PLAN – UPPER LEVEL
1/4" = 1'-0"

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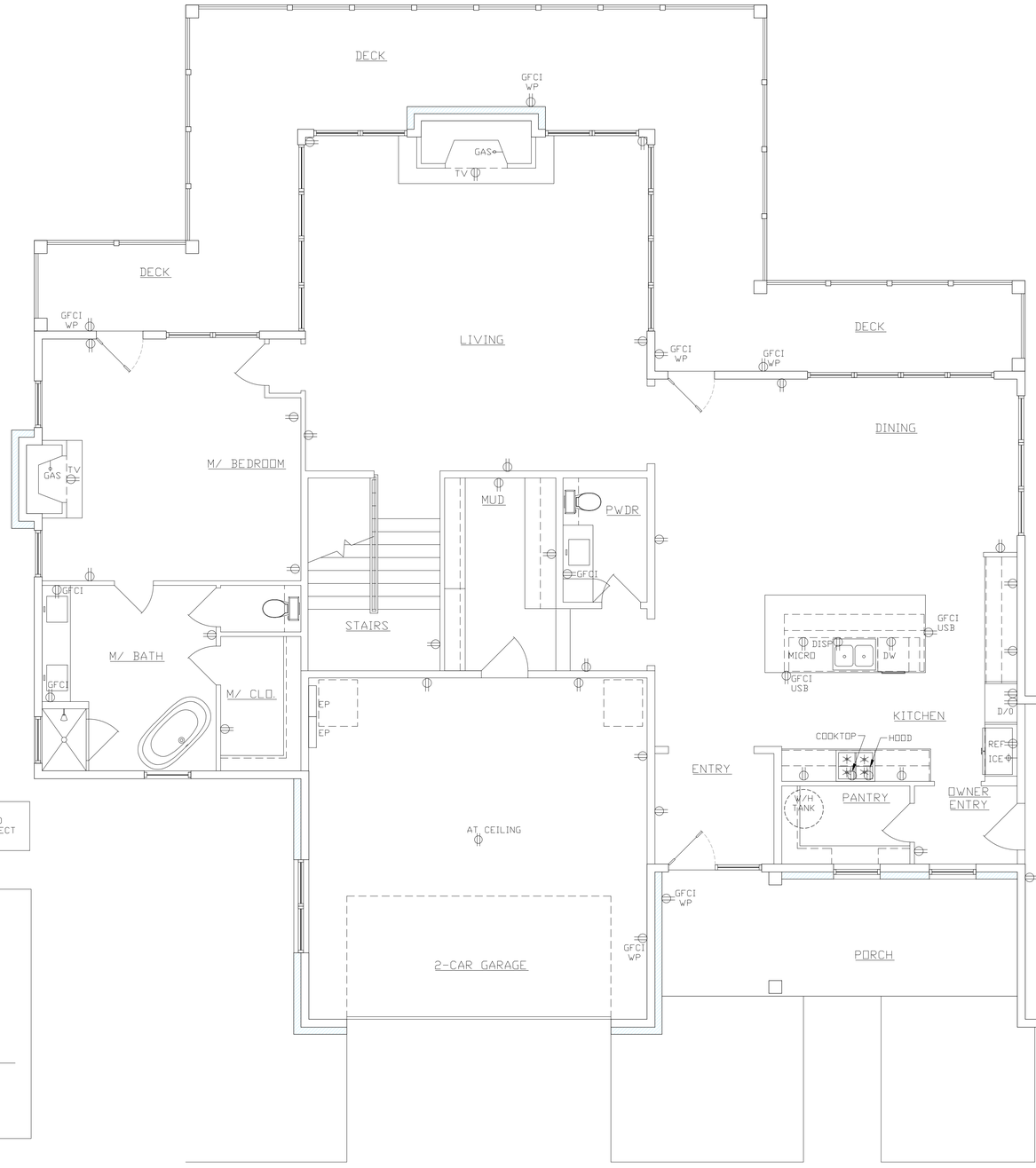
A2.03

RCP PLAN LOWER LEVEL

#24



1 POWER PLAN – UPPER LEVEL
1/4" = 1'-0"

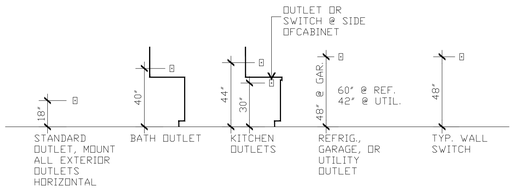
ELECTRIC FIXTURE LEGEND

	DUPLEX OUTLET
GFCI	GROUND FAULT CIRCUIT DUPLEX OUTLET
WP	WEATHER PROTECTED DUPLEX OUTLET
GFCI USB	GROUND FAULT CIRCUIT DUPLEX OUTLET WITH USB
TV	TV AND DATA CONNECTION
EP	ELECTRIC PANEL

G.C. TO VERIFY OUTLET HEIGHTS AT KITCHEN AND BATHROOMS WITH ARCHITECT PRIOR TO INSTALLATION

ELECTRIC FIXTURE HEIGHTS

(UNLESS NOTED OTHERWISE)



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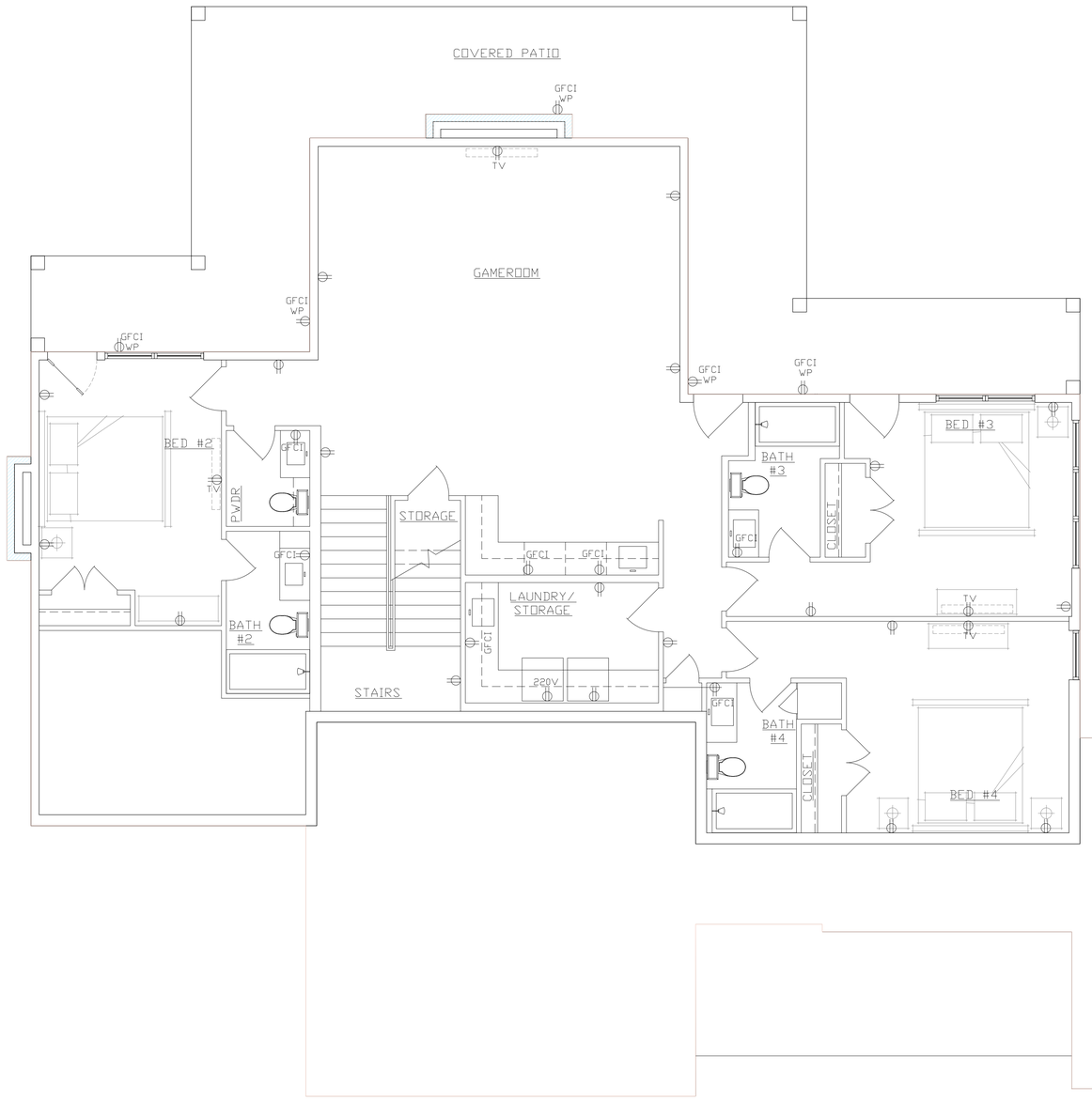
A2.04

POWER PLAN UPPER LEVEL

#25



⏚	DUPLEX OUTLET
GFCI ⏚	GROUND FAULT CIRCUIT DUPLEX OUTLET
WP ⏚	WEATHER PROTECTED DUPLEX OUTLET
GFCI USB ⏚	GROUND FAULT CIRCUIT DUPLEX OUTLET WITH USB
TV ▷	TV AND DATA CONNECTION
EP	ELECTRIC PANEL

1 POWER PLAN – UPPER LEVEL
1/4" = 1'-0"

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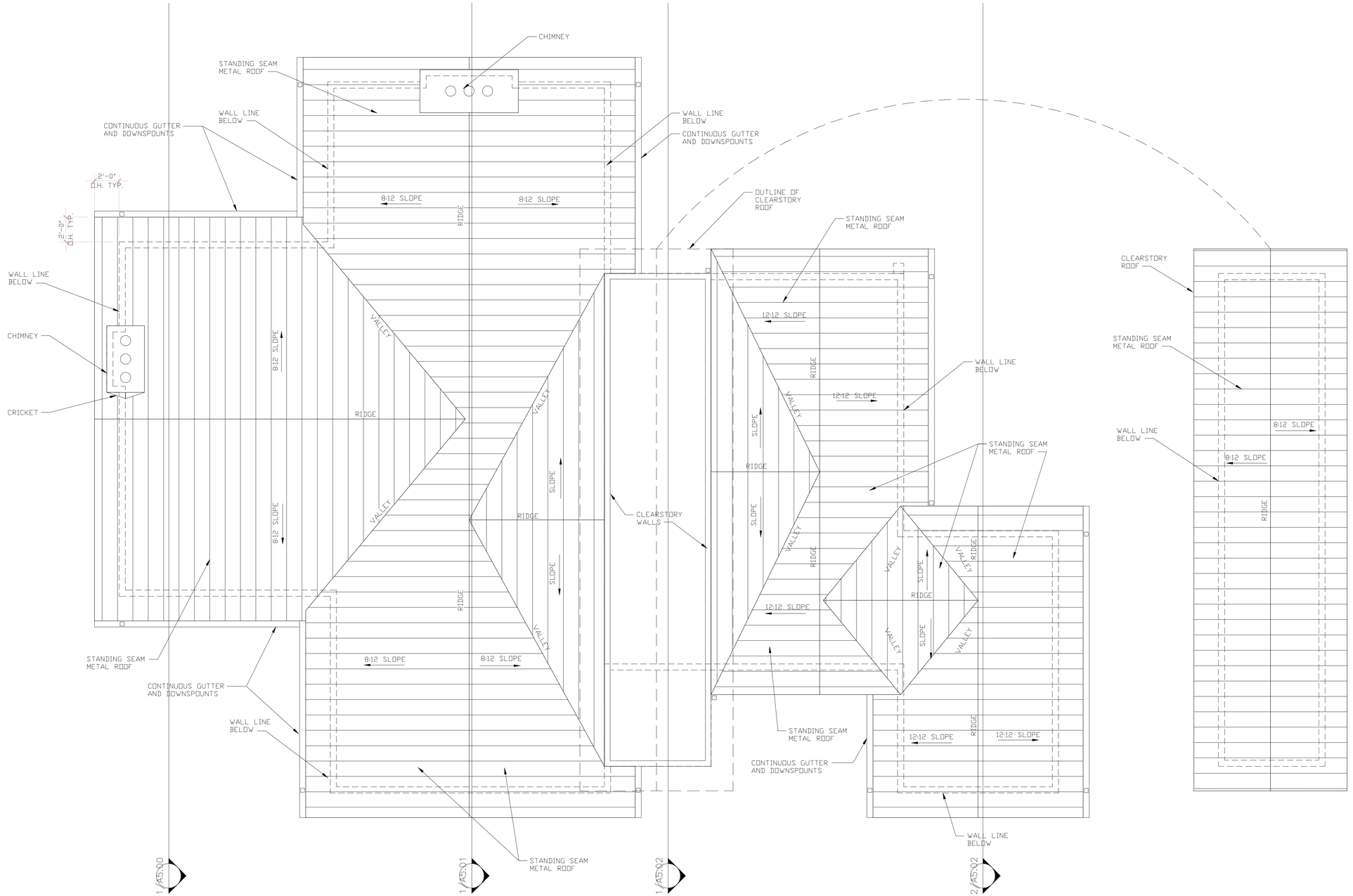
A2.05

POWER PLAN LOWER LEVEL

#26



1 FLOOR PLAN – ROOF PLAN
1/4" = 1'-0"

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04.10.23

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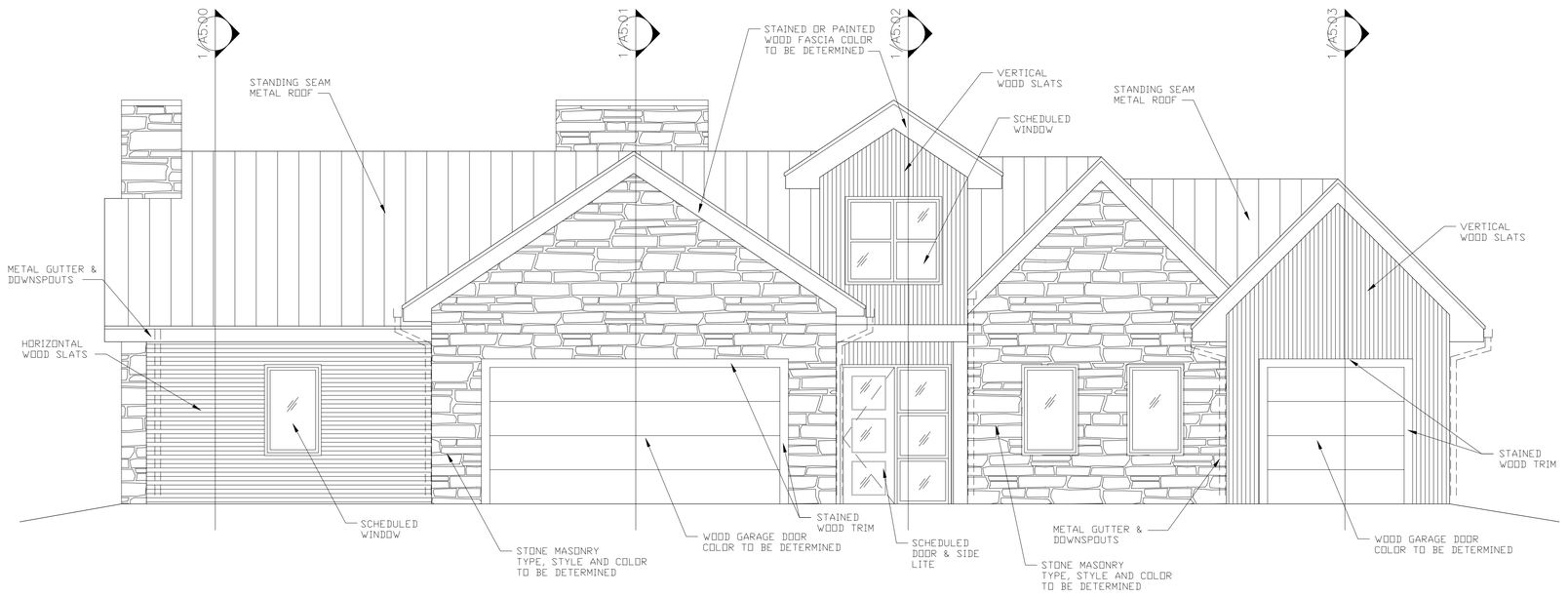
FOR REVIEW

A2.08

ROOF PLAN

#27



1 EXTERIOR ELEVATION – EAST – STREET VIEW
1/4" = 1'-0"

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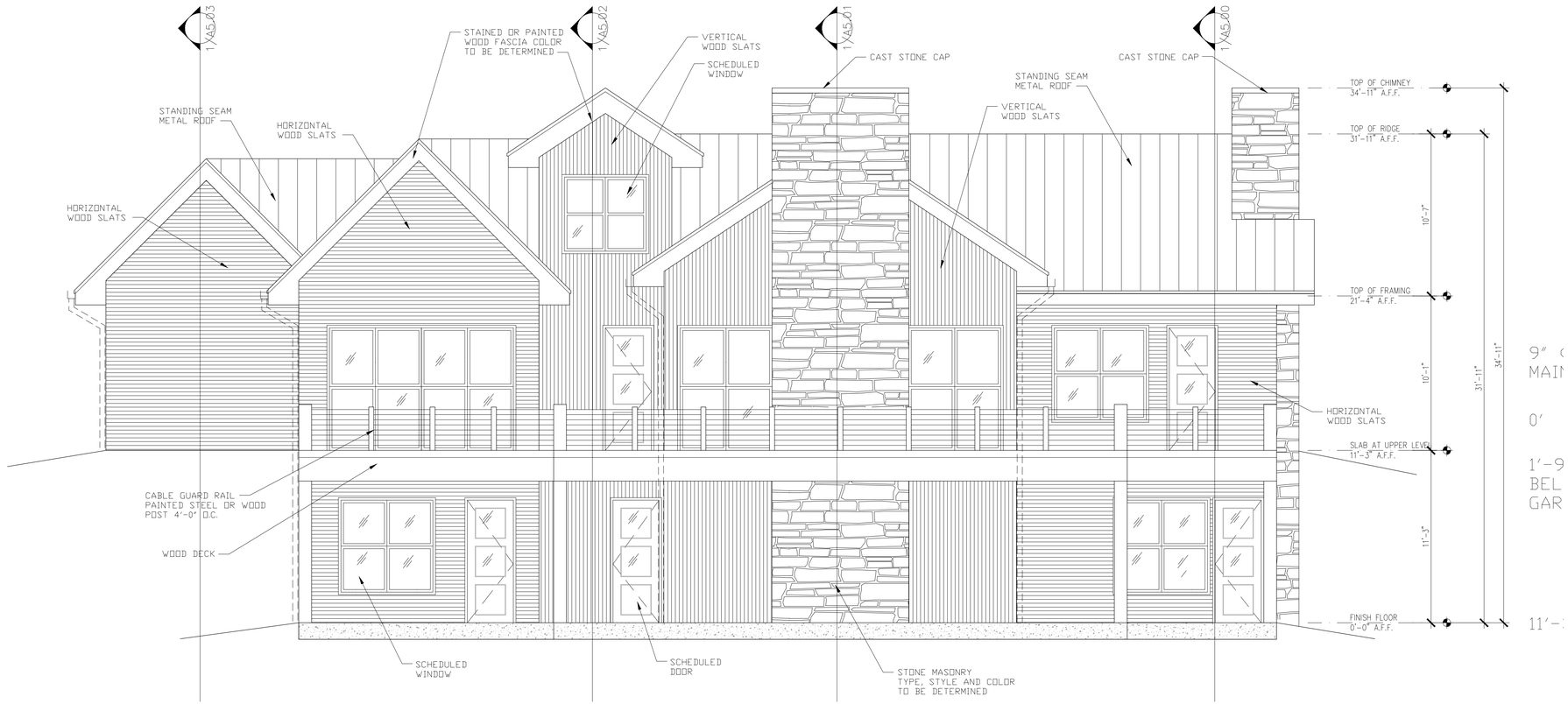
A3.00
EXTERIOR ELEVATIONS

#28



1 EXTERIOR ELEVATION – WEST – RIVER VIEW
1/4" = 1'-0"

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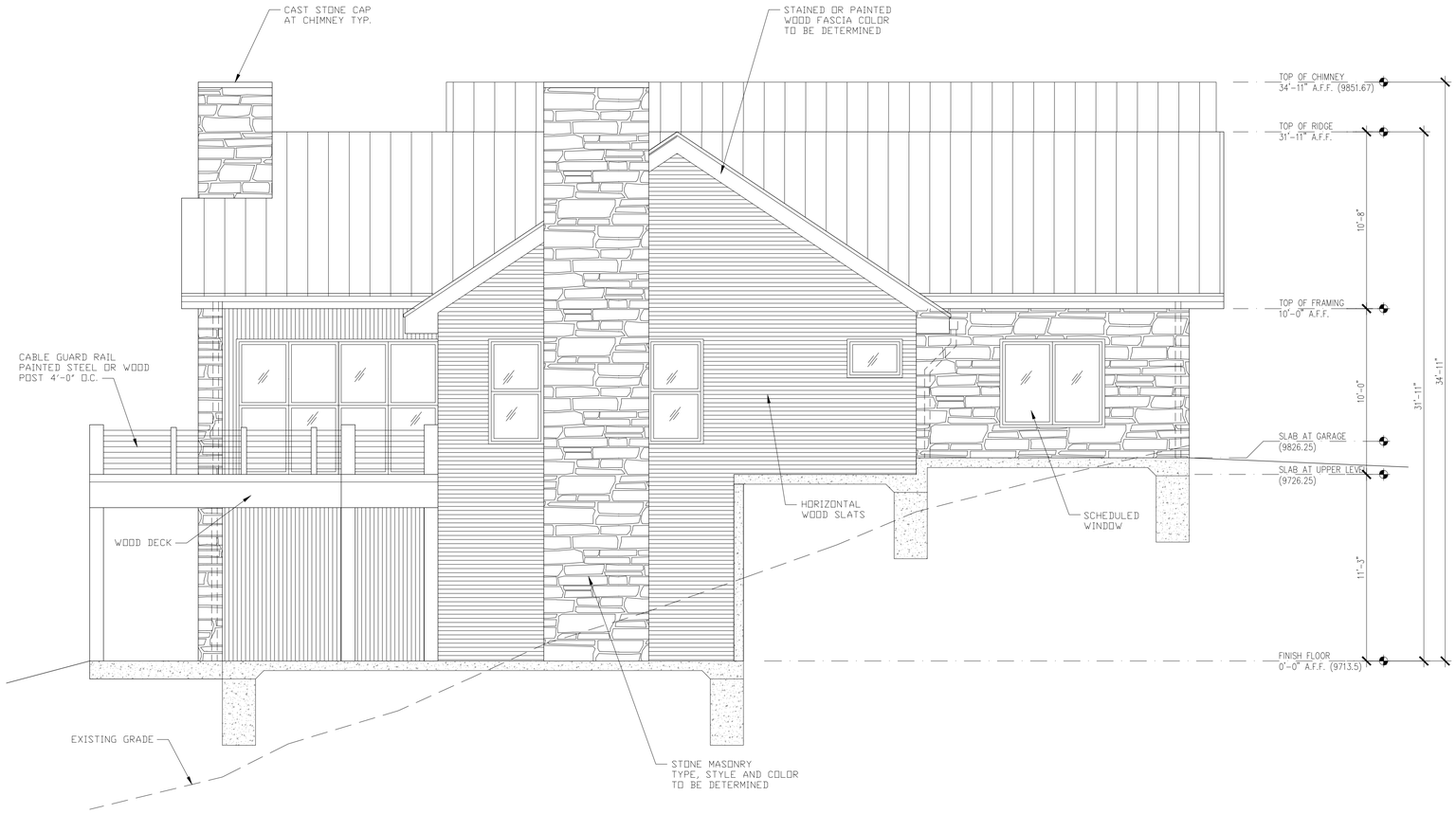
A3.01
EXTERIOR ELEVATIONS

#29



1 EXTERIOR ELEVATION – SOUTH – LAKE DIRECTION
1/4" = 1'-0"

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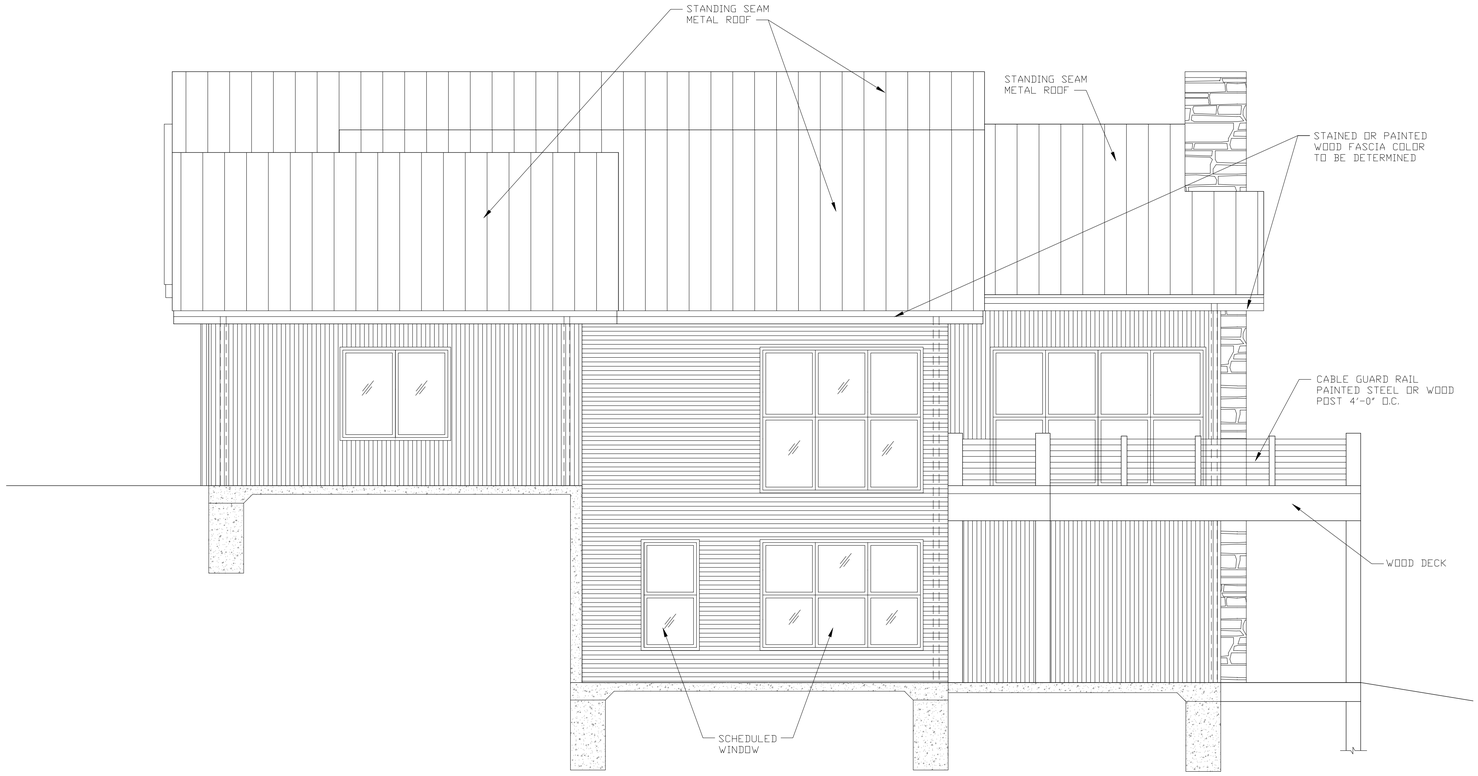
A3.02

EXTERIOR ELEVATIONS

#30



1 EXTERIOR ELEVATION – NORTH – TOWN DIRECTION
1/4" = 1'-0"

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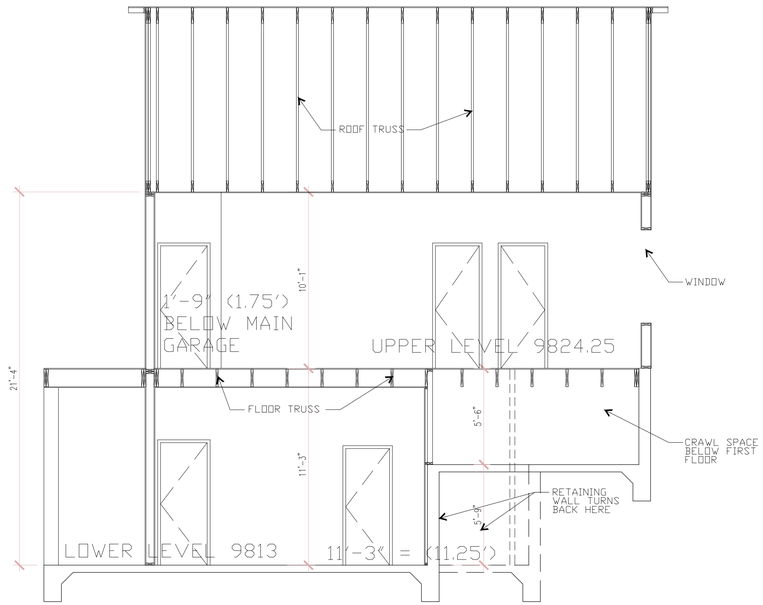
A3.03
EXTERIOR ELEVATIONS

#31



1 BUILDING SECTION
1/4" = 1'-0"

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ARCHITECTURE LLC
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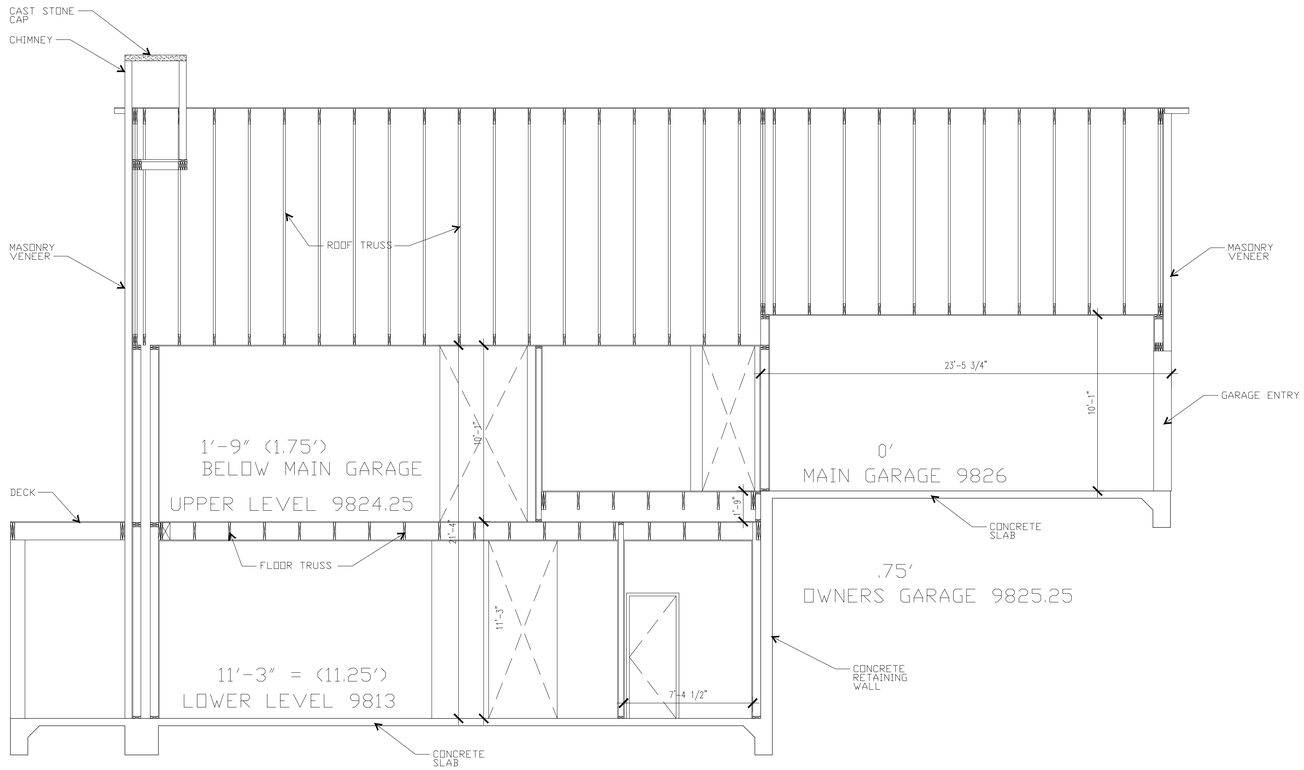
A5.00

BUILDING SECTION

#32



1 BUILDING SECTION
1/4" = 1'-0"

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BLUE RIVER , COLORADO 80424

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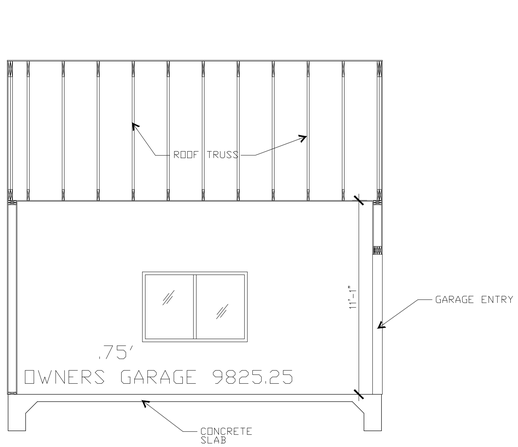
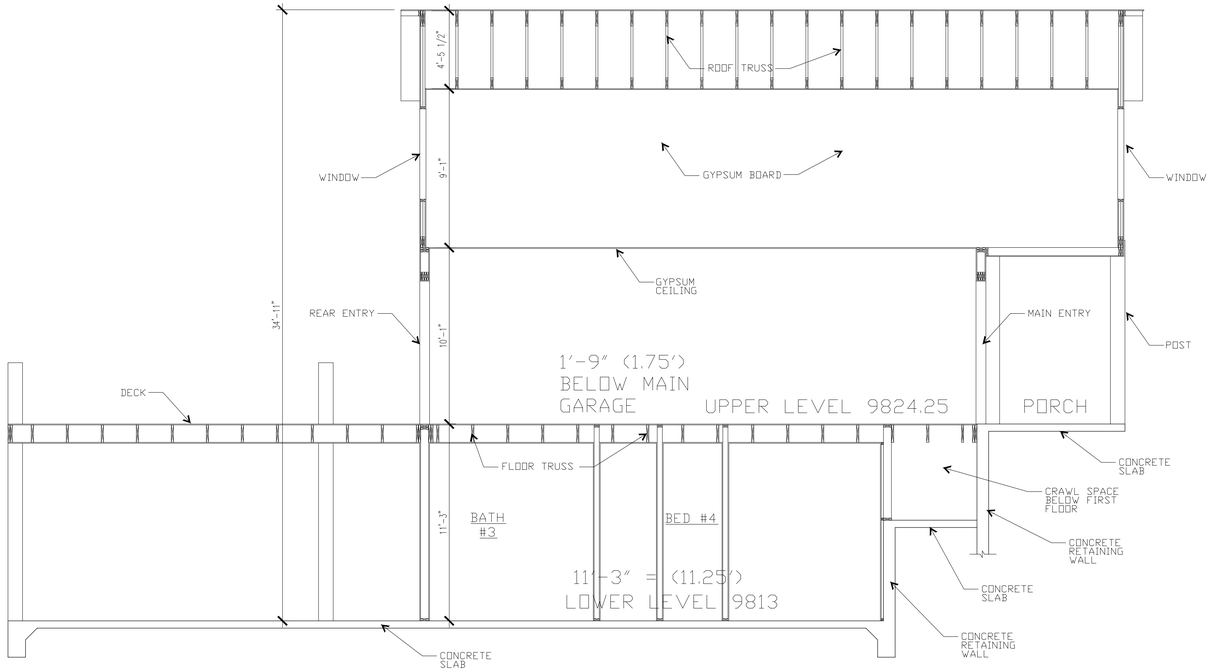
A5.01

BUILDING SECTION

#33



2 BUILDING SECTION
1/4" = 1'-0"



1 BUILDING SECTION
1/4" = 1'-0"

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BLUE RIVER , COLORADO 80424

COLORADO LICENSED
TIMOTHY PAUL ROSE
00406141
ARCHITECT
04.10.23

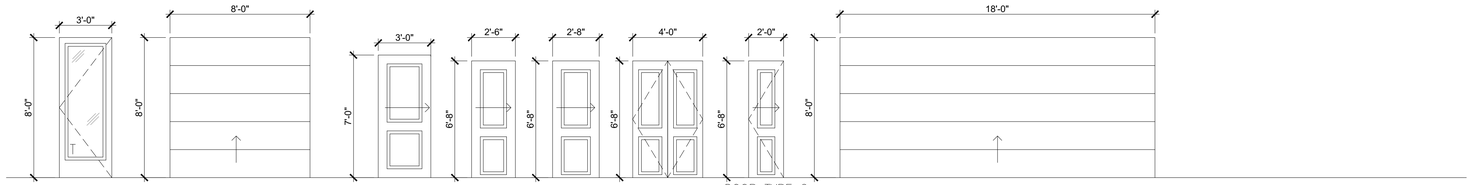
PROJECT NUMBER		22066
REVISIONS		
No.	Description	Date

FOR PERMIT

A5.02

BUILDING SECTION

T – IMPACT RESISTANT TEMPERED GLASS Z97–1975



DOOR TYPE A | DOOR TYPE B | DOOR TYPE C | DOOR TYPE D | DOOR TYPE E | DOOR TYPE F | DOOR TYPE G NOT USED | DOOR TYPE H

DOOR /HARDWARE SCHEDULE

DOORS				DETAILS						INTERIOR FRAME		EXTERIOR FRAME			REMARKS
MARK	SINGLE	PAIR	TYPE	THICKNESS	MATERIAL	FINISH	GLASS	HEAD	JAMB	SILL	MATERIAL	FINISH	MATERIAL	FINISH	HARDWARE SET	
100	X		A	1 3/4"	S.C.W.D./GLASS	PAINTED	G–01				WOOD	PAINTED	SIDING TRIM	PAINTED	LOCK SET	SELF CLOSING HARDWARE
101	X		A	1 3/4"	S.C.W.D./GLASS	PAINTED	G–01				WOOD	PAINTED	SIDING TRIM	PAINTED	LOCK SET	SELF CLOSING HARDWARE
102		X	F	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
103	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
104	X		E	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
105	X		H	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
106		X	F	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
107	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
108	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
109	X		E	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
110	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
111	X		G	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
112	X		E	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
113	X		A	1 3/4"	S.C.W.D./GLASS	PAINTED	G–01				WOOD	PAINTED	SIDING TRIM	PAINTED	LOCK SET	SELF CLOSING HARDWARE
114		X	F	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
115	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
200	X		A	1 3/4"	S.C.W.D./GLASS	PAINTED	G–01				WOOD	PAINTED	SIDING TRIM	PAINTED	LOCK SET	SELF CLOSING HARDWARE
201	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
202	X		C	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
203	X		A	1 3/4"	S.C.W.D./GLASS	PAINTED	G–01				WOOD	PAINTED	SIDING TRIM	PAINTED	LOCK SET	SELF CLOSING HARDWARE
204	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
205	X		C	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
206	X		E	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
207	X		A	1 3/4"	S.C.W.D./GLASS	PAINTED	G–01				WOOD	PAINTED	SIDING TRIM	PAINTED	LOCK SET	SELF CLOSING HARDWARE
208	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
209	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			LOCK SET	
210	X		D	1 3/4"	S.C.W.D.	PAINTED					WOOD	PAINTED			PASSAGE	
211	X		H	--	METAL	PAINTED					WOOD	PAINTED	SIDING TRIM	PAINTED	–	BY MANUFACTURE
212	X		B	--	METAL	PAINTED					–	–	SIDING TRIM	PAINTED	–	BY MANUFACTURE

GL–01: 1/4" THICK, HUMAN IMPACT RESISTANT PER ANSI Z97–1975. CLEAR LOW–E GLASS.
GL–02: 1/4" CLEAR TEMPERED GLASS, ALL INTERIOR GLASS (I.E. ROOM DOORS AND SHOWER DOORS, ETC.)

GLASS ENERGY NOTES: SGHC: .8

NOTE:
1) S.C.W.D. = SOLID CORE WOOD DOOR, REFER TO ARCHITECT FOR STAIN COLOR.
2) GLAZING SHALL CONFORM TO 2018 IBC SECTION 2406.3 AND 2604.04. ALL GLASS/ALUM DOOR SHALL BE CLASS "A"

CONTRACTOR TO PROVIDE SUBMITTAL DRAWINGS FOR DOORS AND WINDOWS FOR REVIEW BY ARCHITECT.

DOOR NOTES:

1. PROVIDE CYLINDERS AND MASTER KEYING OF ALL LOCKS PER DIRECTION OF OWNER.
2. THE HARDWARE CONTRACTOR SHALL PROVIDE AS PART OF THE BID, ANY INCIDENTAL HARDWARE ITEMS TO COMPLETE THE HARDWARE SPECIFIED AND SHALL PROVIDE A LIST OF SUCH ADDITIONAL HARDWARE ITEMS WITH THE BID.
3. LABELED FRAMES MUST BE PROVIDED AT DOORS SCHEDULED TO BE PROVIDED WITH A U.L. LABEL RATING. AS REQUIRED.
4. PROVIDE WEATHER PROOF MEMBRANE FLASHING AT ALL EXTERIOR DOOR AND WINDOW HEAD, JAMB AND SILL AS REQUIRED. TYPICAL.
5. CONTRACTOR TO VERIFY SWING OF DOOR WITH FLOOR PLAN. SWING ADDED FOR CONVENIENCE ONLY.

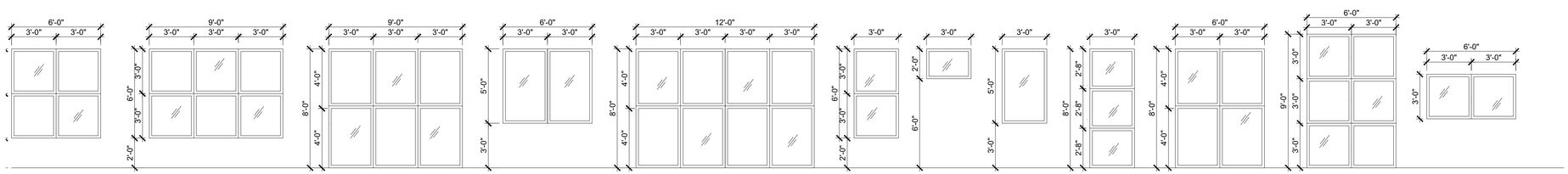
WINDOW SCHEDULE

MARK	FRAME OPENING SIZE WIDTH X HEIGHT	MATERIAL	GLASS	FINISH	HEAD	JAMB	SILL	REMARKS
A	6'–0"x6'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE – SINGLE HUNG
B	9'–0"x 6'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
C	9'–0"x 8'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
D	6'–0"x 5'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
E	NOT USED							
F	12'–0"x 8'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
G	3'–0"x 6'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE – SINGLE HUNG
H	3'–0"x 2'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
I	3'–0"x 5'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
J	3'–0"x 8'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
K	6'–0"x 8'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
L	6'–0"x 9'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED
M	6'–0"x 3'–0"	VINYL & GLASS	G–01	BLACK				G.C. TO VERIFY ROUGH OPENING SIZE– FIXED

NOTE:
GL–01: 1/4" THICK, HUMAN IMPACT RESISTANT PER ANSI Z97–1975. CLEAR LOW–E GLASS.

GLASS ENERGY NOTES:
WINDOWS: SGHC: .4
U FACTOR = .55

1) PROVIDE WEATHER PROOF MEMBRANE FLASHING AT ALL EXTERIOR DOOR AND WINDOW HEAD, JAMB AND SILL AS REQUIRED. TYPICAL.
2) GLAZING SHALL CONFORM TO 2018 IBC SECTION 2406.



A 6'0" X 6'0" | B 9'0" X 6'0" | C 9'0" X 8'0" | D 6'0" X 5'0" | F 12'0" X 8'0" | G 3'0" X 6'0" | H 3'0" X 2'0" | I 3'0" X 5'0" | J 3'0" X 8'0" | K 6'0" X 8'0" | L 6'0" X 9'0" | M 6'0" X 3'0"

ROSE-VILLACORTE ARCHITECTURE LLC
HOUSTON-DALLAS, TEXAS
WWW.RVAARCH.COM

BLUE RIVER MOUNTAIN HOME

311 WAGON ROAD
BLUE RIVER, COLORADO 80424

COLORADO LICENSED
TIMOTHY PAUL ROSE
00406141
ARCHITECT
04.10.23

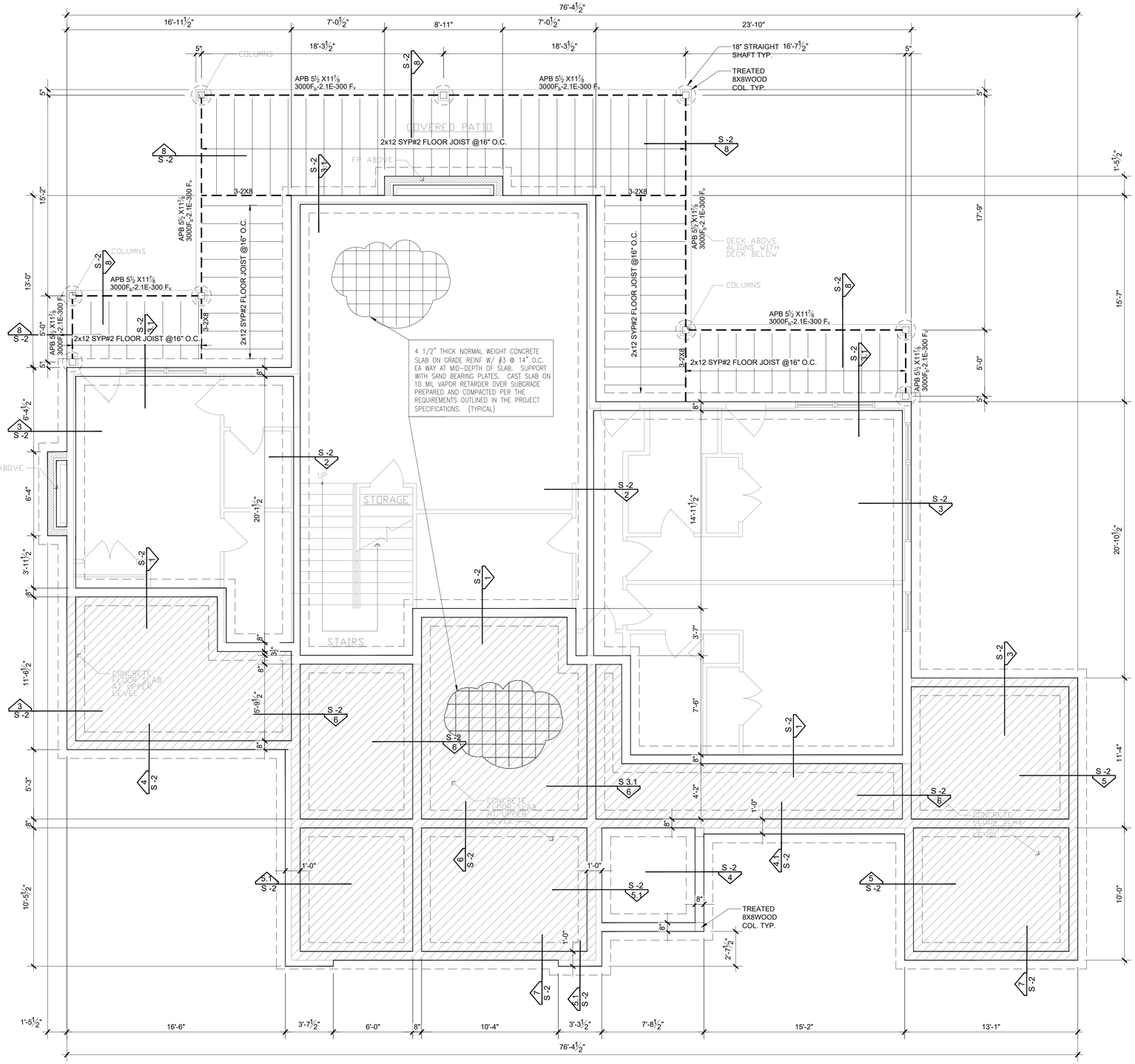
PROJECT NUMBER	22066

REVISIONS

No.	Description	Date

FOR PERMIT

A6.00
DOOR AND WINDOWS



PROPOSED FOUNDATION PLAN

SCALE: 1/4"=1'-0"

#35

FOUNDATION NOTES

1. THE DETAILS SHOWN ON THIS DRAWING ARE TO BE USED IN A RIGID MONOLITHIC SLAB DESIGNED IN ACCORDANCE WITH THE BUREAU OF RESEARCH AND ADVISORY BOARD (BRAB) AS EXTENDED IN THE CRITERIA FOR THE SELECTION AND DESIGN OF SLABS ON GROUND.
2. WORK THIS DRAWING IN CONFORMANCE WITH THE NOTES SPECIFIED HEREIN AFTER, AND WITH THE GENERAL NOTES ON THE FOUNDATION DRAWING.
3. RE-BARS LAPS OR SPLICES MUST BE A MINIMUM OF 30 BAR DIAMETER LONG.
4. LAPS OF REINFORCING BARS MUST BE STAGGERED A MINIMUM OF 5" IN CASE A WELDED WIRE FABRIC IS USED INSTEAD OF THE #3 AT RE – BARS SHOWN. (NO WWF IS ALLOWED THIS CASE SMALLER THAN 6X6 W2.9 X W2.9).

SITE PREPARATION

SUBGRADE PREPARATION AND COMPACTION SHALL BE PERFORMED ACCORDING TO THE SOIL REPORT, DATED 2/2/2023 PREPARED BY STEPHEN GEORGE P.E.

1. CLEAN THE SITE BENEATH THE SLAB OF ALL GRASS AND WEEDS BY REMOVING THE TOP 6 INCHES OF SOIL AND DISPOSE. REMOVE BY GRUBBING TO CREATE DEPTHS TREES AND LARGE BUSHES AND ALL DECAYED OR DYING ORGANIC MATERIALS. REMOVE ALL TREE WITHIN 15 FEET OF THE FOUNDATION.
2. THE NATURAL SUBGRADE SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF 18 INCHES. THE SCARIFIED SOILS SHOULD THEN BE RECOMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM D-698). THE MOISTURE CONTENT SHOULD RANGE FROM -1% TO +3% OF OPTIMUM MOISTURE.
3. STRUCTURAL FILL SHALL BE SANDY CLAY. CLEAN FROM ALL ORGANIC MATERIAL, AND SHALL HAVE A PLASTICITY INDEX BETWEEN 7 AND 20.
4. STRUCTURAL FILL SHALL BE PLACED IN LAYERS, NOT TO EXCEED 8", AND COMPACTED TO 95%, OF ITS MAXIMUM DRY DENSITY. (ASTM D698)
5. A BEDDING LAYER OF LEVELLING # STONE, A MAXIMUM OF FOR (4) INCHES THICK MAY BE PLACED IMMEDIATELY BENEATH THE FLOOR SLAB. A VAPOR BARRIER CONSISTING OF SIX MIL PLASTIC SHEETING SHOULD BE PLACED OVER THE SAND CUSHION TO PREVENT WATER MIGRATION THROUGH THE CONCRETE SLAB. THE EXCAVATIONS FOR THE GRADE BEAMS SHOULD BE CLEAN AND FREE OF ANY LOOSE MATERIALS PRIOR TO CONCRETE PLACEMENT.
6. AFTER THE SLAB HAS BEEN COMPLETED. THE STABILITY OF ITS MOISTURE CONTENT MUST BE MAINTAINED.
7. BACKFILL AROUND THE EXTERIOR BEAMS OF THE STRUCTURE SHALL BE MOISTENED AND COMPACTED AND SHOULD BE SLOPED TO DRAIN AWAY FORM THE STRUCTURE IN ALL DIRECTIONS. NO PONDING IS TO BE ALLOWED NEXT TO THE STRUCTURE.
8. AFTER THE SLAB HAS BEEN COMPLETED. THE STABILITY OF ITS MOISTURE CONTENT MUST BE MAINTAINED.

RE-BAR NOTES

1. REINFORCING BARS MUST BE DEFORMED, GRADE 60 CONFORMING TO ASTM A – 615.
2. WELDED WIRE FABRIC MUST BE 65 KSI AS PER ASTM A – 185, MUST BE LAPPED IN ACCORDANCE WITH ACI 318 LATEST EDITION.
3. RE-BARS MUST CONFORM TO THE DETAILS & NOTES SHOWN ON THE FOUNDATION DETAILS DRAWING. ATTENTION MUST BE GIVEN TO THE PLACEMENT OF CORNER BARS AND BARS PLACED AT INTERSECTION OF INTERIOR TO EXTERIOR BEAMS.
4. SLAB REINFORCEMENT AS DESIGNED MUST BE #3 @ 14 INCHES ON CENTER EACH WAY, IN CASE WELDED WIRE FABRIC IS USED INSTEAD. IT SHOULD HAVE THE SAME STEEL AREA AS THE #3 @ 14 INCHES ON CENTER IT REPLACES.
5. STIRRUPS IN GRADE BEAMS SHALL BE #3 @ 18 INCHES ON CENTER STARTING AT 10 INCHES FROM CORNERS AND INTERSECTIONS.

CONCRETE NOTES

1. CONTRACTOR, BUILDER MUST VERIFY ALL DIMENSIONS, DROPS AND OFFSETS AGAINST ARCHITECTURAL DRAWINGS AND MUST REPORT ANY DISCREPANCIES TO THE ENGINEER OR THE ARCHITECT PRIOR TO COMMENCING THE JOB.
2. CONCRETE IN FOUNDATION MUST HAVE A MINIMUM OF 3000 PSI COMPRESSIVE STRENGTH AFTER 28 DAYS.
3. WATER-CEMENT RATIO IN CONCRETE MIX SHALL BE LOW (3 INCHES SLUMP). ADDITION OF ADD MIXTURE SUCH AS CALCIUM CHLORIDE SHALL NOT EXCEED 2% BY WEIGHT OF CEMENT.
4. A 6 MIL POLYVINYL VAPOR BARRIER SHALL BE PLACE BETWEEN THE FOUNDATION AND THE SOIL IT BEARS ON AND MUST BE LAPPED. LAPS MUST BE TAPED.
5. FORMS MUST CONFORM TO THE SIZE AND SHAPE OF THE FOUNDATION. BE SECURELY TIGHT, PREVENT LEAKING AND ALLOW CONCRETE TO BE VIBRATED WITHOUT DISPLACEMENT.

ARCHITECT

CONTRACTOR

FIRM

Sarab Structural a Civil, LLC
Sarab Structural & Civil, LLC
13831 Northwest Freeway, Suite 245
Houston Texas 77040 (832) 922-1145
Office: (713) 485-5641

ENGINEER

COLORADO LICENSED KARIM S. SARAB 57999 PROFESSIONAL ENGINEER
04-10-2023

ISSUED FOR:
☐ DESIGN DEVELOPMENT ☐ PROGRESS 10 % ☐ BIDDING ☐ PERMIT ☒ CONSTRUCTION DOCUMENT ☐ CLIENT

REVISION	DATE
1	

SINGLE-FAMILY RESIDENCE
311 Wagon Rd, Blue River, CO 80424

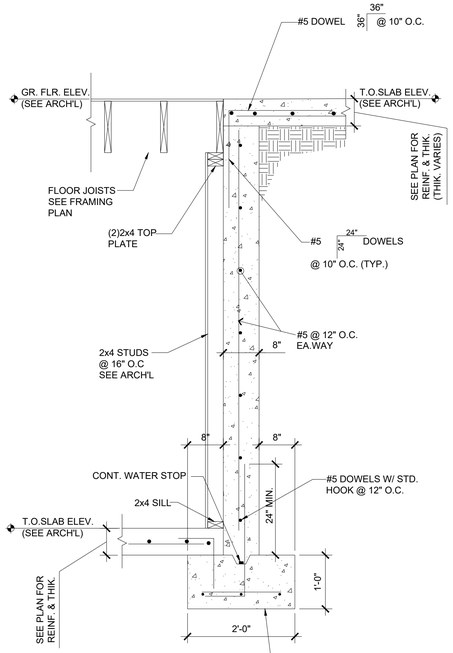
PROJECT LOCATION:

SHEET TITLE: Foundation Plan

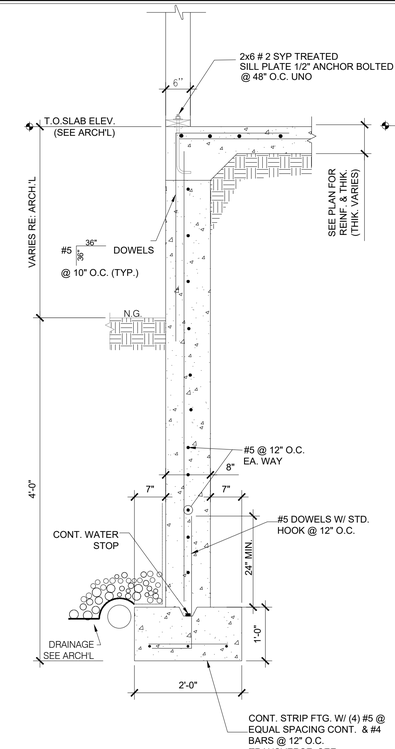
DATE: 04/10/2023

SHEET
S-1

#36



-01- SECTION
SCALE 3/4" = 1'-0"



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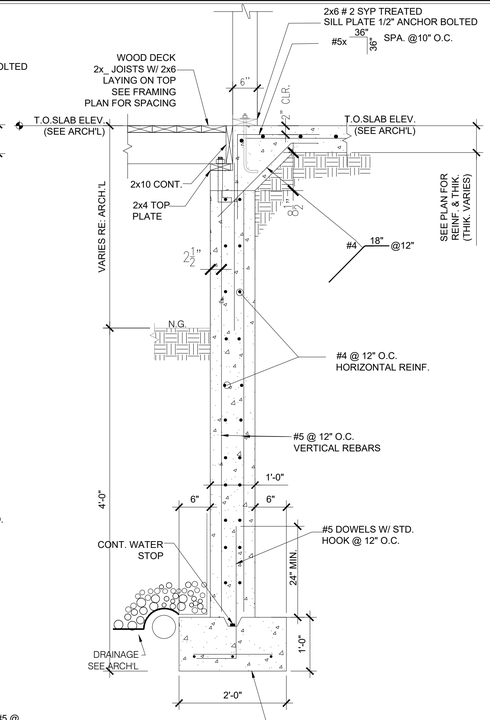

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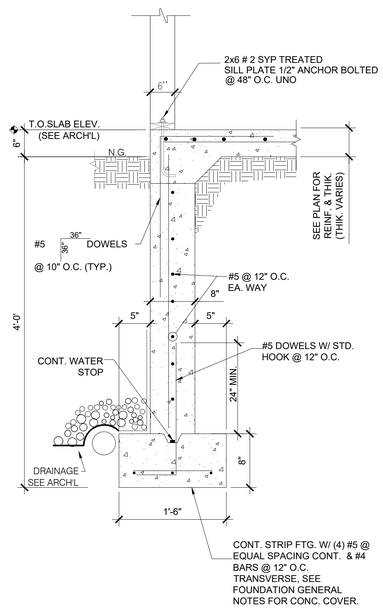

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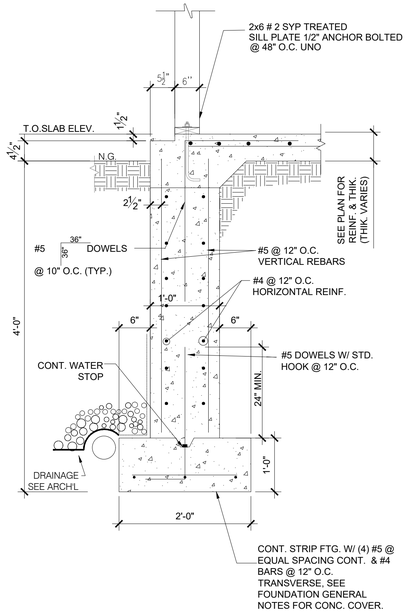

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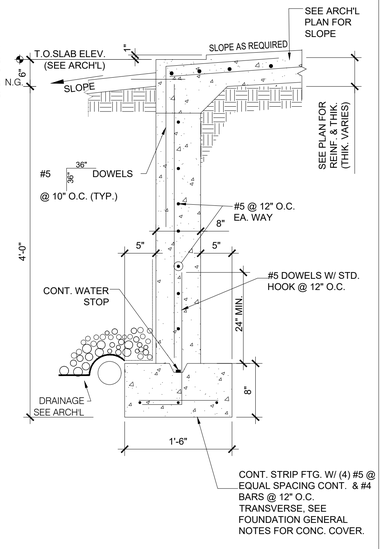
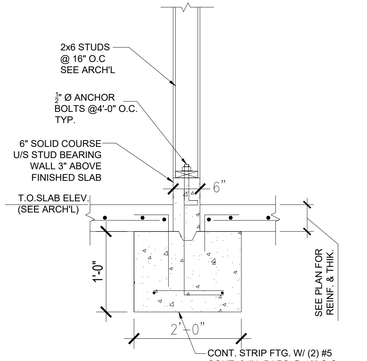


TYPICAL DRILLED PIER DETAIL

-8- SECTION
SCALE: 3/4" = 1'-0"

-07- SECTION
SCALE: 3/4" = 1'-0"



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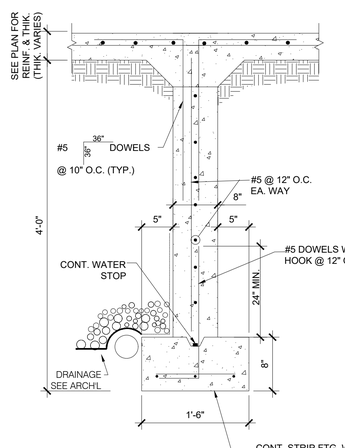

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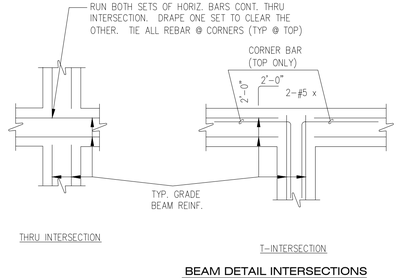

BEAM DETAIL INTERSECTIONS
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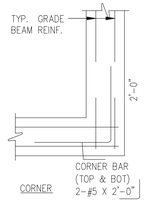

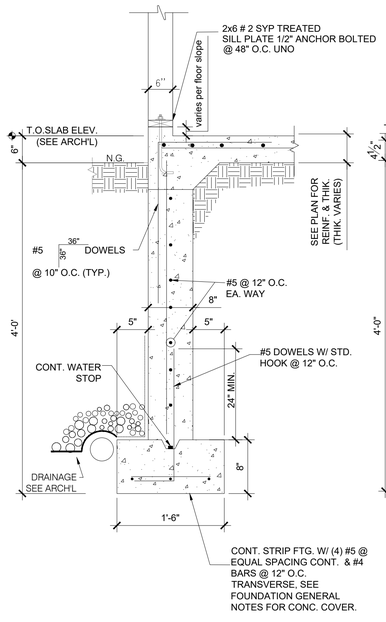

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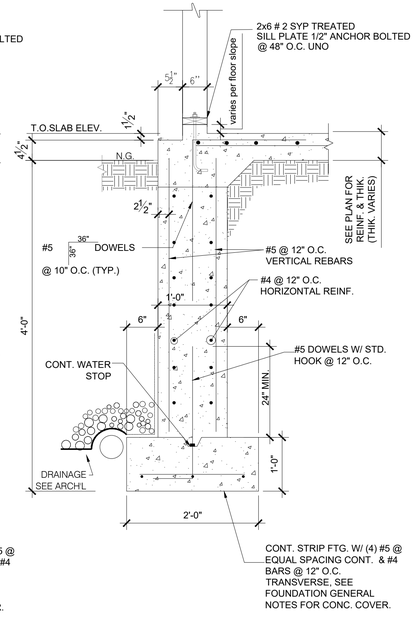

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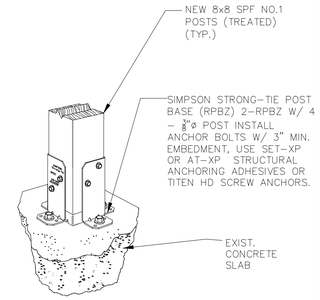
SCALE: 3/4" = 1'-0"

SHAFT REINFORCEMENT	
SHAFT DIA.	VERT. REINF.
18"Ø	6-#6



-4.1- TYP.POST BASE CONNECTION DET.
SCALE: NTS

ARCHITECT

CONTRACTOR

FIRM

Sarab Structural a Civil, LLC
Sarab Structural & Civil, LLC
13831 Northwest Freeway, Suite 245
Houston Texas 77040 (832) 922-1145
Office: (713) 485-5641

ENGINEER

COLORADO LICENSED
KARIM S. DAHLAN
57999
PROFESSIONAL ENGINEER
04-10-2023

ISSUED FOR:
- ☐ DESIGN DEVELOPMENT
- ☐ PROGRESS 100 %
- ☐ BIDDING
- ☐ PERMIT
- ☒ CONSTRUCTION DOCUMENT
- ☐ CLIENT

REVISION

DATE

SINGLE-FAMILY RESIDENCE
311 Wagon Rd, Blue River, CO 80424

PROJECT LOCATION:

SHEET TITLE: Foundation Details

DATE: 04/10/2023

SHEET
S-2

#37

GENERAL NOTES: FOUNDATION SYSTEM

(THESE NOTES SHALL CONTROL UNLESS OTHERWISE NOTED ON PLANS AND DETAIL.)

SOILS REPORT

1. IT IS CONTRACTOR'S RESPONSIBILITY TO REVIEW THIS REPORT FOR SITE PREPARATION AND GRADE BEAMS/ FOOTINGS.

SUBGRADE PREPARATION:

1. STRIP AREAS WITHIN BUIDING LINES REMOVE ALL VEGETATION, TOP SOIL AND DEBRIS.
2. FOLLOWING STRIPPING, PROOF ROLL EXPOSED SUBGRADE TO IDENTIFY WEAK OR SOFT AREAS ,SUCH ZONES SHALL BE REMOVE AND REPLACE WITH SELECED FILL.
3. PROVIDE A UNIFORM LEVEL GRADE FOR THE PLECEMENT OF VOID BOXES, USE LEVELING SAND IF & AS REQUIRED.

SURFACE DRAINAGE:

THE FOLLOWING DRAINAGE PRECAUTIONS SHOULD BE OBSERVED DURING CONSTRUCTION AND AT ALL TIMES AFTER THE STRUCTURE HAS BEEN COMPLETED. BUILDER SHALL ADVISE OWNER OF THESE PRECAUTIONS.

1. BACKFILL AROUND THE STRUCTURE SHOULD BE A COHESIVE SOIL MATERRIAL WHICH SHOULD BE MOISTENED AND COMPACTED TO AT LEAST NINETY (90) PERCENT OF STANDARD PROCTOR DENSITY. ANY COHESIONLESS SOIL MATERIAL ACCUMULATED AROUND THE PERIMETER OF THE STRUCTURE DURING CONSTRUCTION SHOULD BE REMOVED AND NOT ALLOWED TO BE MIXED WITH OR COVERED BY THE BACKFILL MATERIAL.
2. THE GROUND SURFACE SURROUNDING THE EXTERIOR OF THE STRUCTURE SHOULD BE SLOPED TO DRAIN AWAY FROM THE STRUCTURE IN ALL DIRECTIONS MINIMUM DISTANCE OF FIVE (5) FEET (OR DISTANCETO PROPERTY LINE, WHICHEVER IS LESS), WITH A MINIMUM OF FIVE (5) PERCENT (%) SLOPE. WATER SHOULD NOT BE ALLOWED TO POND NEXT TO THE STRUCTURE.
3. IN NO SUCH INSTANCE SHALL SURFACE DRAINAGE BE ALLOWED TO CROSS OVER ANY SIDE OR BACK PROPERTY LINES UNLESS A COMMON DRAINAGE AGREEMENT OR COMMON AREA AGREEMENT IS IN FORCE.
4. WHERE LANDSCAPING IS TO BE INSTALLED NEXT TO PERIMETER GRAGE BEAMS, A, MOISTURE BARRIER OR OTHER SUITABLE MEANS SHOULD BE INSTALLED TO PREVENT MOISTURE FROM ENTERING THE UNDERLYING CLAY SOILS.
5. ROOF DOWNSPOUTS AND DRAINS SHOULD DISCHARGE WELL AWAY FROM THE LIMITS OF THE FOUNDATION OR EDGE OF PERIMETER GRADE BEAMS.

GENERAL WOOD FRAMING NOTES:

1. DESIGN CRITERIA:
   A. CODES:
      IRC 2015
      AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (TIMBER CONSTRUCTION MANUAL, LATEST EDITION).
      BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (A.C.I. 318).

2. TIMBER SPECIFICATIONS:
   A. STRUCTURAL TIMBER SHALL BE MACHINE STRESS RATED (MSR) 1950 F-1.7 E SOUTHERN YELLOW PINE (M.C.-19%), OR APPROVED (BY THE STRUCTURAL ENGINEER) EQUAL UNLESS OTHERWISE NOTED ON DRAWINGS, WITH ALLOWABLE STRESSES AS FOLLOWS:

      BENDING STRESS..... 1,950 PSI
      SHEAR STRESS.....90 PSI
      COMPRESSION STRESS PARALLEL TO GRAIN.... 1,800 PSI
      MODULUS OF ELASTICITY.....1,700,000 PSI

   B. STRUCTURAL GLUE LAMINATED TIMBER SHALL BE VISUALLY GRADED (MC 15%) SOUTHERN PINE WITH THE FOLLOWING MINIMUM ALLOWABLE STRESSES:

      BENDING STRESS..... 3,000 PSI
      SHEAR STRESS..... 290 PSI
      MODULUS OF ELASTICITY..... 2,100,000 PSI

   C. FLOOR JOISTS – OPEN WEB MANUFACTURED WOODEN TRUSSES TO BE ENGINEERED BY OTHERS. WOOD TRUSSES TO BE SPACED AS SHOWN ON FRAMING PLANS, FLOOR DEAD LOAD 10 PSF, FLOOR LIVE LOAD 40 PSF
      DEFLECTION LIMIT: LIVE LOAD L/360 & TOTAL LOAD L/240
      ADHESIVES TO MEET REQUIREMENTS OF ASTM D-2559-94 (WET USE)
      EXPOSURE CONDITIONS.

   D. PLYWOOD SHEATHING:
      I. EACH CONSTRUCTION AND INDUSTRIAL PANEL SHALL BE IDENTIFIED WITH THE APPROPRIATE TRADEMARK OF THE AMERICAN PLYWOOD ASSOCIATION, AND SHALL MEET THE REQUIRMENTS OF THE LATEST EDITION OF THE U.S. PRODUCT STANDARD PS 1 OR APA PRP-108 PERFORMANCE STANDARDS. ALL PANELS WHICH HAVE ANY EDGE OR SURFACE PERMANENTLY EXPOSED TO THE WEATHER SHALL BE CLASSED EXTERIOR.

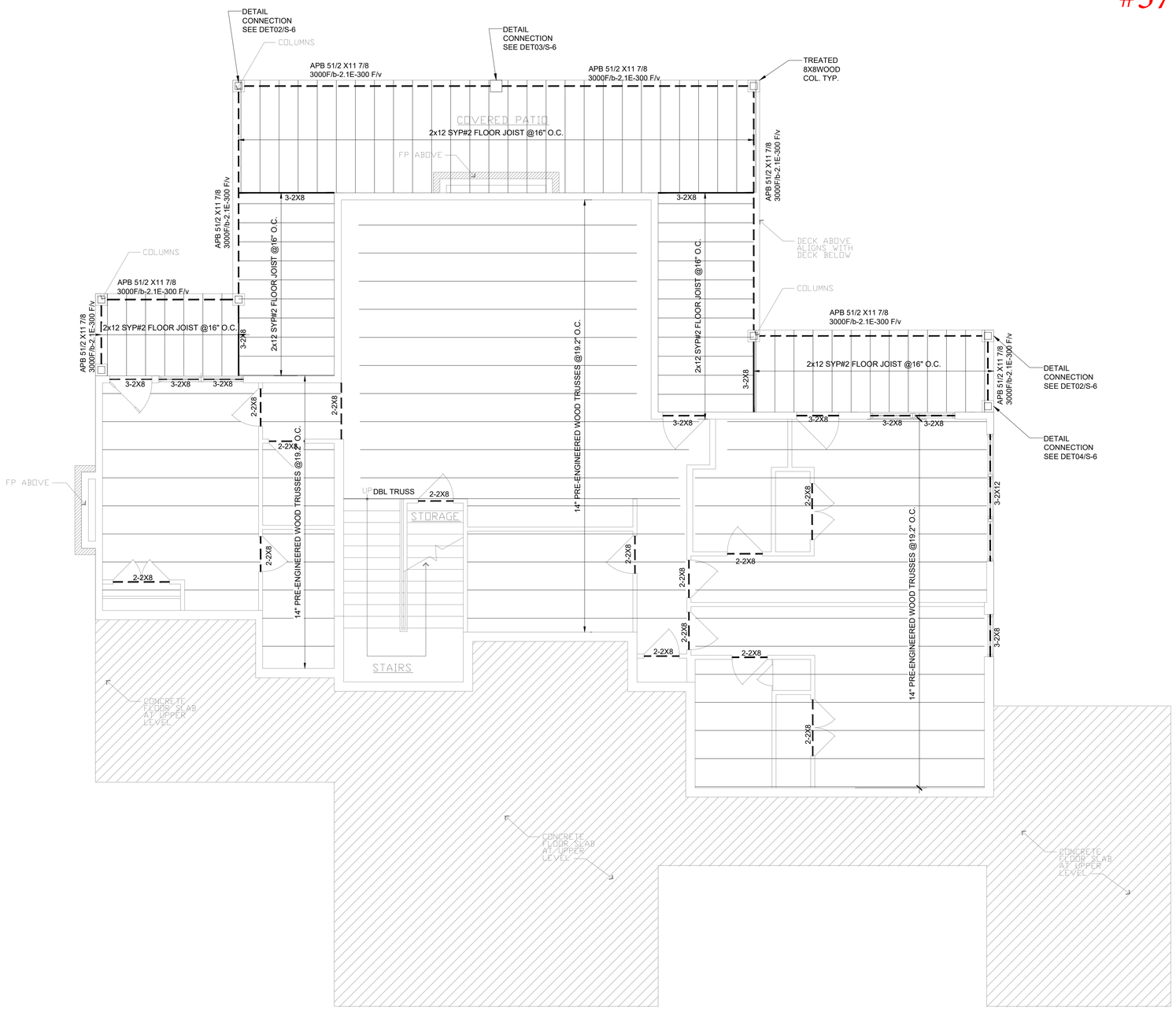
      II. PANEL ROOF, WALL, AND FLOOR SHEATHING SHALL BE 3/4" THICK APA STRUCTURAL I RATED SHEATHING EXP. 2. (UNLESS OTHERWISE NOTED ON DRAWINGS). SHEATHING PERMANENTLY EXPOSED TO WEATHER SHALL BE CLASSED EXTERIOR.

      III. NAIL PANELS WITH COMMON NAILS AT 3" O.C. ALONG SUPPORTED PANEL EDGES AND AT 6" O.C. AN INTERMEDIATE SUPPORTS.

   E. WOOD TO WOOD FRAMED CONNECTIONS ARE TO BE MADE WITH BOLTS AND/OR JOIST HANGERS AS SHOWN. TOE-NAILING IS NOT PERMITTED.

   F. MAXIMUM SPANS OF DIMENSIONAL LUMBER USED FOR JACK RAFTERS AT HIPPED ROOF SECTIONS SHALL BE IN ACCORDANCE WITH "SPAN TABLES FOR JOISTS AND RAFTERS" AS PUBLISHED BY THE NATIONAL PRODUCTS ASSOCIATION.

3. GENERAL CONSTRUCTION:
   A. PROVIDE BEARING OR SOLID BLOCKING AT JOIST MORE THAN 10 FT.
   B. PROVIDE INTERMEDIATE SOLID BLOCKING AT LOAD BEARING STUD.
   C. PROVIDE 3-STUD AT CORNER CONDITION AND AT DIAGONAL TRUSSES BEARING.
   D. NAILING SHALL BE PER IBC REQUIREMENT.
   E. CONNECTORS FOR WOOD CONSTRUCTION SHALL BE MANUFACTURED BY "SIMPSONSTRONG TIE COMPANY INC." CONNECTORS SHALL BE PROPERLY SIZED ACCORDING TO MEMBER SIZE AND APPLICABLE LOADS.



1ST FLOOR FRAMING PLAN
SCALE: 1/4"=1'-0"

ARCHITECT

CONTRACTOR

FIRM

Sarab Structural a Civil, LLC
Sarab Structural & Civil, LLC
13831 Northwest Freeway, Suite 245
Houston Texas 77040 (832) 922-1145
Office: (713) 485-5641

ENGINEER

COLORADO LICENSED
KARIM S. SARAB
57999
PROFESSIONAL ENGINEER
04-10-2023

ISSUED FOR:
- ☐ DESIGN DEVELOPMENT
- ☐ PROGRESS 10 %
- ☐ BIDDING
- ☐ PERMIT
- ☒ CONSTRUCTION DOCUMENT
- ☐ CLIENT

REVISION	DATE

PROJECT LOCATION:
SINGLE-FAMILY RESIDENCE
311 Wagon Rd, Blue River, CO 80424

SHEET TITLE:
Framing 1st Floor Plan

DATE: 04/10/2023

SHEET
S-3

#38

GENERAL CODES & DESIGN LOADS

CODE:
RESIDENTIAL BUILDING CODE--2015

DESIGN LOADS:

1. ROOF LIVE LOADS 20PSF (SUBJECT TO SLOPE & TRIBUTARY AREA REDUCTION FACTORS)
2. FLOOR LIVE LOADS (RESIDENTIAL BUILDING CODE-2015) FOLLOW;

USE	LOAD (PSF)	USE	LOAD (PSF)
EXTERIOR BALCONIES	60	SLEEPING ROOMS	40
DECKS	40	OTHER ROOMS	40
STAIRS	40 (c)	ATTIC W/ STORAGE	20 (b)
GUADRAILS & HANDRAILS	200 (d)	ATTIC W/O STORAGE	10 (b)

(b) INDIVIDUAL STAIR TREADS SHALL BE DESIGNED FOR THE UNIFORMLI DISTRIBUTED LIVE LOAD OR A 300-POUND CONCENTRATED LOAD ACTING OVER AN AREA OF 4 SQUARE INCHES,WHICHEVER PRODUCES THE GREATER STRESSES.
(c) A SINGLE CONCENTRATED LOAD APPLIED IN ANY DIRECTION @ ANY POIN ALONG THE TOP.

3. WIND LOAD
ULTIMATE WIND DESIGN SPEED 115 MPH

EXPOSURE: B RISK CATEGORY: II

4. SNOW LOAD 70 PSF

GENERAL NOTES: COORDINATION W/ARCH.DWGS.

1. CONTRACTOR SHALL REVIEW ARCHITECTURAL AND STRUCTURAL DRAWINGS JOINTLY. TO ENSURE COORDINATION OF ALL PHASES OF CONSTRUCTION DESCRIBED IN DRAWING. DISREPANCIES SHALL BE BROUGTH TO THE ATTENTION OF BOTH ARCHITECT AND ENGINEER, PRIOR TOP PROCEEDING WITH CONSTRUCTION WORK.
2. THE FOLLWING ITEMS, IN PARTICULAR,HAVE TO BE CLOSELY COORDINATED BETWEEN ARCHITECTURAL AND STRUCTURAL DRAWINGS:
A. ALL DIMENSION:
B. SLAB AND FLOOR ELEVATION, SLOPES ,LOCATIONS AND DIMENTION OF ANY RECESSES, INCLUDING THOSE INTENDED FOR SHOWERS, ELEVETORS, FLOORING MATERIALS,FLUSH HEARTHS, ETC.:
C. PLUMBING, GAS, VENT & ELECTRICAL OUTLETS, ETC.;
D. CURBS AND VENEER LEDGES:
E. CEILING HEIGHTS AND CEILING CONDITION
F. ROOF GEOMETRY AND SLOPES.

3. CONTRACTOR IS ADVISED THAT IN ITEMS LISTED UNDER PARAGRAPH 2 ABOVE, ARCHECTURAL DRAWINGS WILL GENERALLY TAKE PRECEDENCE OVER STRUCTURAL DRAWINGS

NOTES ON PRESSURE-TREATED LUMBER:

1. ALL WOOD MEMBERS IN CONTACT WITH CONCRETE, OR EXPOSED TO WEATHER OR MOISTURE (SUCH AS PORCH & BALCONY FRAMING) SHALL BE PRESSURE-TREATED.
2. CURRENTLY THE PRODUCT COMMONLY USED FOR PRESSURE TREATMENT IS ALKLINE COPPER QUATERNARY (ACQ) .THIS MATERIAL IS EXTREMELY CORROSIVE. ONLY HOT-DIPPED GALVANIZED ANCHOR BOLTS, THRU BOLTS ,NAILS, OR OTHER CORROSIVE-RESISTANT FASTENRS,SHALL BE USED WITH ACQ-TREATED LUMBER. FASTENER MANUFACTURER OR SUPPLIER SHALL BE CONSULTED ON THE SUITABILILY OF GALVANZED FASTENER FOR USE WITH TREATED LUMBER.

NOTE:
PIPES THROUGH THE BEAMS SHALL BE SLEEVED 2 PIPE SIZE LARGER THAN THE PIPE, AND SHALL SHEDULE 40 PIPE.

CONTRACTOR TO VERIFY ALL DIMENSIONS, ELEVATIONS, AND DETAILS WITH ARCHITECTURAL DRAWINGS PRIOR TO CONSTRUCTION & BIDDING. ANY DISCRIPANCY IF FOUND SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER. FAILURE TO DO SO SHALL OBLIGATE THE CONTRACTOR FOR ANY JOB EXPENSE ARISING DUE TO ANY ERRORS THAT MAY OCCUR HEREON.

GENERAL NOTES: WOOD FRAMING SYSTEM

(THESE NOTES SHALL CONTROL UNLESS NOTED OTHERWISE ON PLANS AND DETAIL.)

BEAMS AND HEADERS

ROOF RAFTERS :----------NO 3 SOUTHERN YELLOW PIPE (SYP), KD, S4S
CEILING JOISTS:----------NO 3 SOUTHERN YELLOW PIPE (SYP), KD, S4S
BEAMS & HEADERS :--------NO 2 SOUTHERN YELLOW PIPE (SYP), KD, S4S
STUDS: ----------STUD GRAGE, SYP, KD, S4S.
WOOD POSTS:----------NO. 2 SYP SURFACE, GREEN

1. AT BEAM MADE UP OF A NUMBER OF 2x JOISTS, EACH JOIST WILL BEAM ON A WALL STUD (LE, NUMBER OF WALL STUD SHALL MATCH NUMBER OF JOISTS BEARING ON THESE STUD THE CENTERLINE OF THE BEAM SHALL BE THE CENTERLINE OF THE SUPPORTING WALL STUDS.
2. ALL BEAM MADE UP OF A NUMBER OF 2x JOISTS SHALL BE FASTENED AS FOLLOWS. FOR THE MAXIMUM HORIZONTAL SPACING OF BOLTS.
   2-2x12 16d NAILS @ 12" TOP AND BOTTOM STAGGER, EA. FACE
   3-2x12 20d NAILS @ 12" TOP AND BOTTOM STAGGER, EA. FACE
3. ALL DOOR AND WINDOW HEADERS (OR HEADERS AT ANY OTHER OPENING) THAT ARE NOT SPECFIED ON PLANS SHALL BE AS FOLLOWS:
   CEILING FRAMING: 2-2x8
4. MINIMUM BEARING ANY BEAM OF HEADER AT A STUD WALL IS 3 1/2".

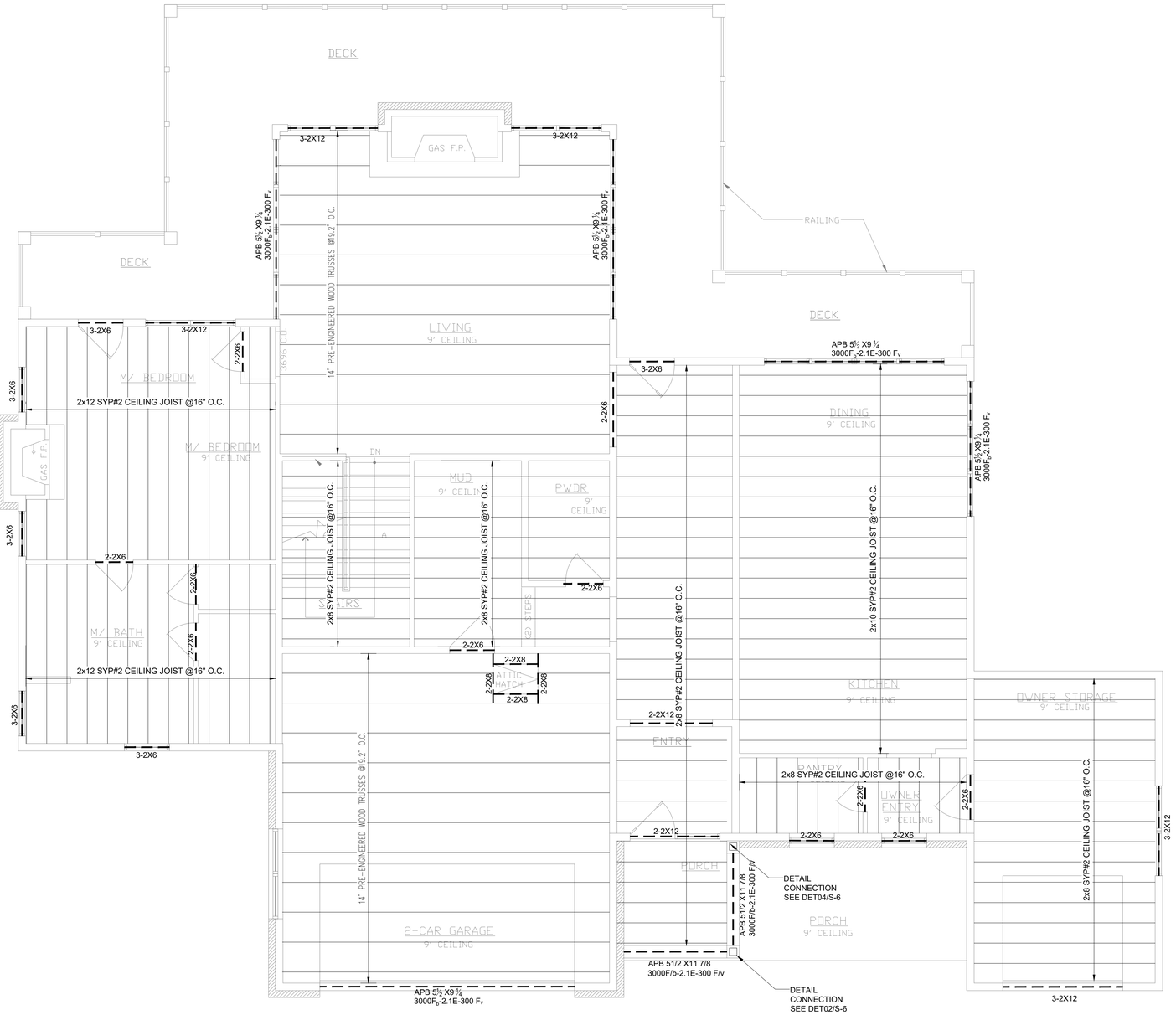
JOISTS

1. JOISTS BLOCKING
   A) JOISTS WITH A DEPTH GREATER THAN 6" SHALL BE LATERALLY SUPPORTED AT EACH END AND AT EACH SUPPORT BY SOLID BLOCKING EXCEPT WHERE THE ENDS OF JOISTS ARE NAILED INTO A HEADER, BANDOR DIM JOISTS OR TO AN ADJOINING STUD. SOLID BLOCKING SHALL MATCH THE DEPTH OF THE JOIST.

2. JOISTS HOLES AND NOTCHES.
   A) NOTCHES IN TOP OR BOTTON OF JOISTS SHALL NOT EXEED ONE SIXTH (1/6) THE JOIST DEPTH AND SHALL NOT BE LOCATED WITHIN MIDDLE THIRD OF THE SPAN.
   B) HOLES SHALL NOT BE CLOSER THAN 2" TO TOP OR BOTTON OF JOIST, THE DIAMETER OF ANY HOLE SHALL NOT EXCEED ONE FOURTH (1/4) BE JOIST DEPTH UNLESS APPROVED BY THE ENGINEER.

CONNECTORS AND FASTENERS.

1. CONNECTORS SHALL BE AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC. SAN LEANDRO, CA, OR NAIL ALL NAIL HOLES.
2. PROVIDE BASE AND CAP CONNECTORS AT ALL COLUMNS 4x4 OR LARGER, AS FOLLOWS:
   COLUMN BASE CONNECTOR: CB SERIES
   COLUMN CAP CONNECTOR: PC SERIES (OR EPC AT BM ENDS)
   USE APPLICABLE COLUMN/BEAM MODEL NUMBERS.
3. WHERE REQUIRED JOISTS HANGERS SHALL BE 16 GA., GALVANIZED "U-STANDARD" JOIST HANGERS APPLICABLE TO CORRESPODING SIZE, INCLUDING DOUBLED OR TRIPLED JOISTS,
4. WHERE REQUIRED, JOIST HANGERS SHALL BE 12 GA., GALVANIZED, "B-SERIES" APPLICABLE TO CORRESPODING SIZE.
5. PROVIDE 1/2" X 0'-10" LONG ANCHOR BOLT @ 4'-0" O.C, AT ALL EXTERIOR WALL SILL PLATES, WITH 2" PROJECTION AND 1" THREAD.
6. WHERE CALLED OUT, ALL THROUGH BOLTS BE ASTM A-370, PROVIDE STANDARD WASHERS AT ALL WOOD SURFACES.
7. ALL BOLTS, NUTS, WASHERS, NAIL & OTHER FASTENERS EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED.



CEILING FRAMING PLAN
SCALE: 1/4"=1'-0"

ARCHITECT

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FIRM
Sarab Structural a Civil, LLC
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13831 Northwest Freeway, Suite 245
Houston Texas 77040 (832) 922-1145
Office: (713) 485-5641

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REVISION / DATE

SINGLE-FAMILY RESIDENCE
311 Wagon Rd, Blue River, CO 80424

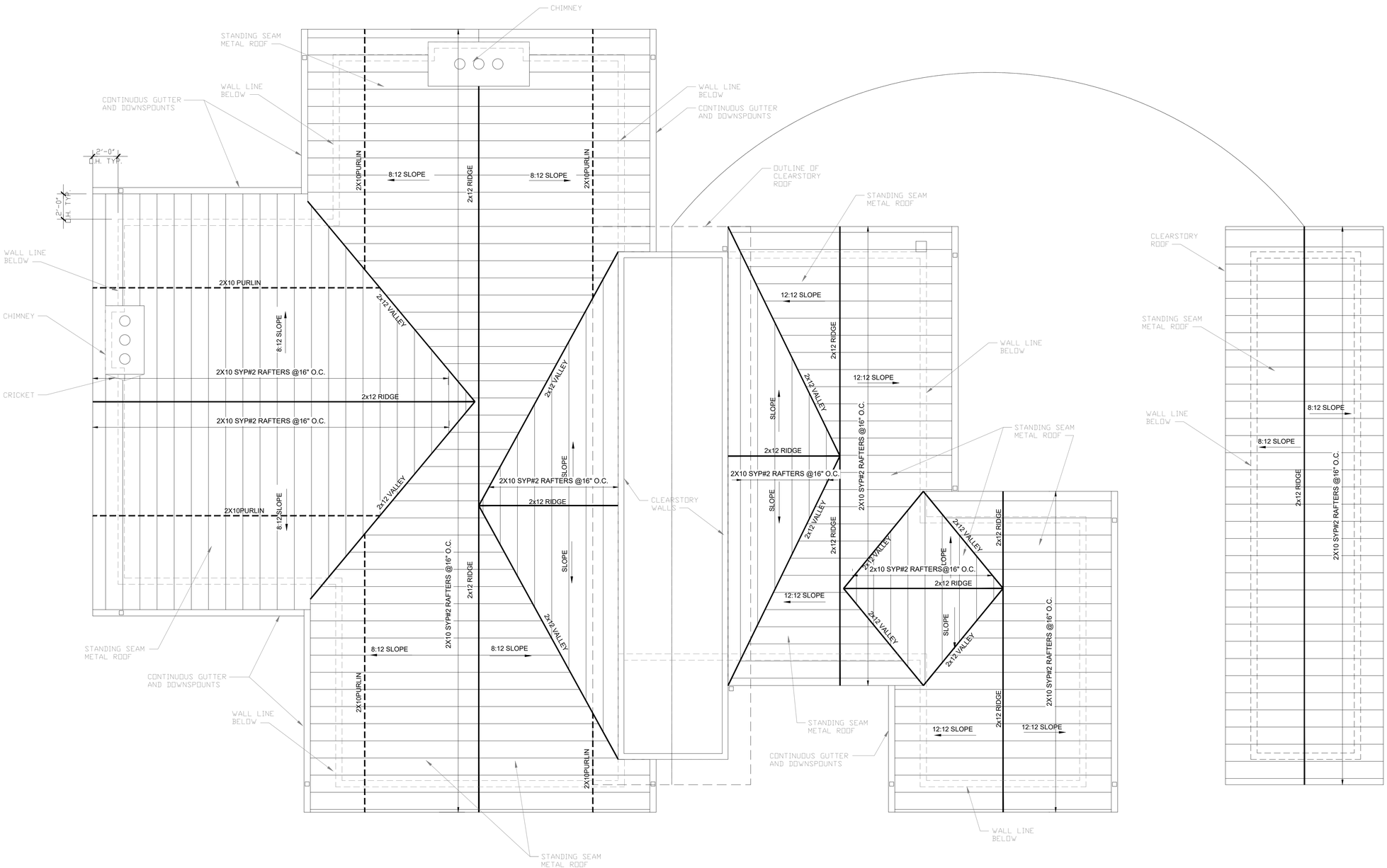
PROJECT LOCATION:

SHEET TITLE: Ceiling Framing Plan

DATE: 04/10/2023

SHEET
S-4

#39



ROOF FRAMING PLAN

SCALE: 1/4"=1'-0"

SNOW LOAD = 56 PSF
LIVE LOAD =20 PSF
DEAD LOAD=15 PSF
BASIC COMBINATIONS:
T_{L1}=D+S
T_{L2}=D+0.75*L+0.75*(L or S or R)
TOTAL LOAD =72 PSF

ARCHITECT

CONTRACTOR

FIRM

Sarab Structural & Civil, LLC
Sarab Structural & Civil, LLC
13831 Northwest Freeway, Suite 245
Houston Texas 77040 (832) 922-1145
Office: (713) 485-5641

ENGINEER

COLORADO LICENSED
KARIM S. DABLEH
57999
PROFESSIONAL ENGINEER
04-10-2023

ISSUED FOR:
- ☐ DESIGN DEVELOPMENT
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DATE	REVISION
1	

SINGLE-FAMILY RESIDENCE
PROJECT LOCATION: 311 Wagon Rd, Blue River, CO 80424

SHEET TITLE: Roof Framing Plan

DATE: 04/10/2023

SHEET
S-5

NAILING SCHEDULE – – FRAMING MEMBERS

CONNECTED MEMBERS	NAIL SIZE (NOTE)	NUMBER OR NAILING PATTERN
BRIDGING TO JOIST	8d	2 TOE NAIL EA. END
SOLE PLATE TO JOIST OR BLOCKING	16d	@ 16" O.C. FACENAIL.
TOP PLATE TO STUD	16d	2 END NAIL.
STUD TO SOLE PLATE	8d OR 16d	4 TOE NAIL 2 END NAIL
DOUBLE STUD	16d	@ 24" FACE NAIL
DOUBLE TOP PLATES	16d	@ 16" FACE NAIL
TOP PLATES: LAPS & INTERSECTIONS	16d	2 FACE NAIL.
CONTINUOUS HEADER, TWO PIECE.	16d	@ 16" FACE NAIL ALONG EA. EDGE
CELING JOISTS TO PLATE	8d	3 TOE NAIL
CONTINUOUS HEADER TO STUD	8d	4 TOE NAIL
CELING JOISTS, LAPS OVER PARTITIONS.	16d	3 FACE NAIL
CELING JOISTS TO PARALLEL RAFTERS.	16d	3 FACE NAIL
RAFTERS TO PLATE.	8d	3 TOE NAIL
1" BRACE TO EACH STUD & PLATE.	8d	2 TOE NAIL
BUILT UP CORNER STUDS.	16d	@ 24" FACE NAIL
CONTINUOUS HEADER, 3 OR MORE PIECE & BUILT UP GIRDERS OR BEAMS	BOLTS	RE: GEN. NOTES

NOTES: ALL NAIL SHALL BE COMMON UNLESS NOTED OTHERWISE.

NAILING SCHEDULE--FLOOR & ROOF DECK

DECK TYPE & THICKNESS	NAIL SIZE (NOTE 1)	NUMBER OR NAILING PATTERN
PLYWOOD OR PARTICLE		6"O.C. @ PANEL EDGES 10"O.C. @ INTERMEDIATE SUPPORTS TYPICAL (TYPICAL)
1/2" OR LESS	6" COMMON DEFORMED SHANK OR STAPLE (1)	
19/32" THRU 3/4"	8d COMMON OR 6d DEFORMED SHANK	
7/8" THRU 1" (FLR.)	8d COMMON OR DEFORMED SHANK	
1 1/8" THRU 1 1/4" (FLR.)	10d COMMON OR 8d DEFORMED SHANK	

NOTES: (1) CORROSION–RESISTANT STAPLES

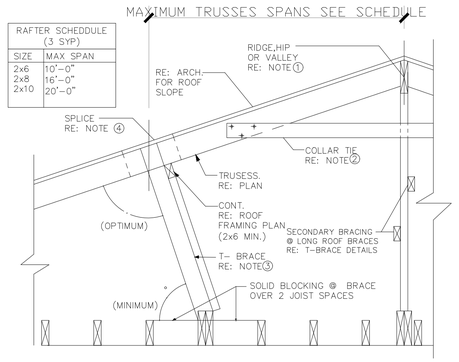
NAILING SCHEDULE--WALL SHEATHING AND SIDING

SHEATHING TYPE & THICKNESS	FASNER SIZE & TYPE	NAILING PATTERN
PLYWOOD & PARTICLE BOARD		6" O.C. @ PANEL EDGES
LESS THAN 1/2"	6d COMMON DEFORMED SHANK OR STAPLE	12"O.C. @ INTERMEDIATE SUPPORTS
1/2" THRU 3/4"	8d COMMON OR 6d DEFORMED SHANK	
FIBERBOARD		
1/2" OR LESS	8d COMMON NAILS OR	
	NO.11 GA. NAILS (2) OR,	
	NO.16 GA. STAPLES (3) OR,	4"O.C. @ PANEL EDGES
25/32"	8d COMMON NAILS OR	6"O.C. @ INTERMEDIATE SUPPORTS
	NO.11 GA. NAILS (2) OR,	
	NO.16 GA. STAPLES (3)	
GYPSUM SHEATHING		
1/2" OR 5/8"	12. GA. (4)	4"O.C. @ EDGES 8"O.C. @ INTERMEDIATE SUPPORTS
GYPSUM WALLBOAD		
1/2"	1 3/8" DRYWALL NAIILS	7"O.C. @ CEILINGS
5/8"	1 1/2" DRYWALL NAIILS	8"O.C. @ WALLS
PANEL SIDING (TO FRAMING)		
1/2" OR LESS	6d (1)	1 EACH PANEL
5/8"	8d (1)	

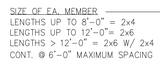
1.NOTES ON "NAIL--WALL SHEATHING & SIDING".

1. CORROSION–RESISTANT SIDING OR CASING NAILS CONFORMING TO THE REQUIREMENTS OR IBC 2012.
2. CORROSION–RESISTANT ROOFING NAIL WITH 7/16–INCH DIAMETER HEAD AND 1 1/2 INCH IN LENGH FOR 1/2–INCH SHEATHING AND 1 3/4–INCH LENGTH FOR 25/32–INCH SHEATHING CONFORMING TO THE REQUIREMENT OF IBC 2012.
3. CORROSION RESISTANT STAPLES WITH NOMINAL 7/16–INCH CROWN AND 1 1/8–INCH LENGTH FOR 1/2–INCH SHEATHING AND 1 1/2–INCH LENGTH FOR 25/32–INCH SHEATHING CONFORMING TO THE REQUIREMENT OF IBC 2012.
4. CORROSION RESISTANT, LARGE HEAD.

TYPICAL WOOD FRAMING DETAIL



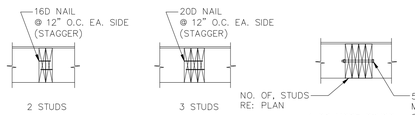
CEILING JOISTS PERPENDICULAR TO TRUSESS

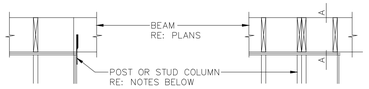


TYPICAL ROOF T–BRACE DETAILS.

TYPICAL ROOF BRACING DETAILS

RIDGE BEAM, HIP & VALLEY TRUSESS & PURLIN





INTEGRAL COLUMN @ WALL END (BEAM PARALLEL W/ WALL)

INTEGRAL COLUMN @ WALL (BEAM PERENDICULA TO WALL)

SUBSTITUTION:
IF STUDS ARE FASTENED AS SHOWN HEREIN, THE FOLLOWING SUBSTITUTIONS MAY BE MADE:
3 STUDS IN LIEU OF 4x4 OR 4x6 POST
4 STUDS IN LIEU OF 6x6 POST

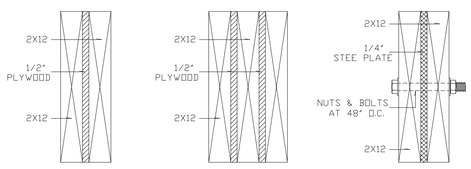
DETAIL: MULTIPLE–STUD COLUMN
NOT TO SCALE

INTEGRAL COLUMN @ WALL END
(BEAM PARALLEL W/ WALL)

NOTES

ALL BEAMS MADE UP OF MULTIPLE 2x MEMBERS SHALL BE SUPPORTED @EA. END BY A POST EQUAL IN THICKNESS TO THE BEAM (MIN.) IE. 2–2x12 BEAM SHALL REQUIRE 2–2x STUD POST (MIN.)
SOLID SAWN LUMBER MAY BE SUBSTITUTED FOR BUILT– UP POSTS.
COLUMNS MADE UP OF MULTIPLE 2x MEMBERS SHALL BE GLUED & FASTENED TO ACT AS A UNIT AS DETAILED BELOW.
UNLESS NOTED OTHERWISE, PARALLEL STRAND LUMBER (PSL) AND LAMINATED LUMBER (LSL & LVL) BEAMS $ HEADERS SHALL BE SUPPORTED AT EACH END AS FOLLOWS:
3 1/2" WIDE MEMBERS .....3–2x STUDS OR 4x6 POST
5 1/2" WIDE MEMBERS UP TO 14" DEPTH.....4–2x STUDS OR 4X6 POST
5 1/2" WIDE MEMBERS OVER 14" DEPTH.....5–2x STUDS OR 4X8 POST
7" WIDE MEMBERS.....5–2x STUDS OR 4x8 POST
MAX. COLUMN OR POST HEIGHT: 10'–0". RE: PLANS OR CONSULT ENGINEER FOR LARGER HEIGHTS.

TYPICAL BEAM DETAILS



STUD WALLS

1. STUD SHALL BE AS FOLLOWS:
   2x4 @ 16" AT ALL FLOORS IN ONE– OR TWO– STORY STRUCTURES.
   DBL 2x4 OR 2x6 @ 16" AT ALL STUD WALL AT FIRST FLOOR AREAS DIRECTLY BELOW A THIRD FLOOR.
2. PROVIDE A MINIMUM OF TWO (2) STUDS AT EACH SIZE OPENINGS LARGER THAN 4"–0" FULL HEIGHT OF WALL (KING STUDS).
3. MAXIMUM STUD WALL HEIGHT SHALL BE AS FOLLOWS:
   2x4 STUDS 10" o.c
   2x6 STUDS 13" o.c
   2x6 STUDS 16" o.c
4. BLOCKING & LATERAL BRACING:
   A. PROVIE BLOCKING AND/OR TEMPOLARY CROSS BRACING AS REQUIRED TO ENSURE STUD STRAIGHTNESS ACCORDING TO SPECIFIED TOLERANCES.
   B. MAXIMUM TOLERANCE FOR STUD STRAIGHTNESS IN ETHER DIRECTION IS 1/4 INCH PER TEN (10) FEET OF STUD HEIGHT.
   C. MINIMUM BOCKING:
      1 ROW FOR STUD HEIGHT UP TO 9'–0"
      2 ROW FOR STUD HEIGHT UP TO 15'–0"
      3 ROW FOR STUD HEIGHT UP TO 15'–0".

HURRICANE CLIPS:

PROVIDE HURRICANE CLIP @ EVERY OTHER ROOF TRUSS OR RAFIER. (SIMPSON H1)

MISCELLANEOUS:

ALL WOOD IN CONTACT WITH CONCRETE OR MASONRY SHALL BE TREATED LUMBER.

ROOF DECK:

1. MINIMUM THICKNESS SHALL BE 1/2" THICK MATERIAL SHALL BE CDX PLYWOOD.
2. ORIENTED STRAND BOARD (OSB) MAY BE USED IN LIEU OF PLYWOOD.
3. MINIMUM NAILING SHALL BE AS REQUIERD BY THE BUILDING CODE.
4. PLYWOOD CLIPS SHALL BE INSTALLED @ ROOF DECKING TO RESULT IN A 1/8" GAP BETWEN ALL PANEL EDGES PROVIDE 1 CLIP PER SPAN (JOIST SPACING). CLIPS SHALL BE SIMPSON PSCL, TO MATCH CORRESPONDING PLYWOOD THICKNESS.

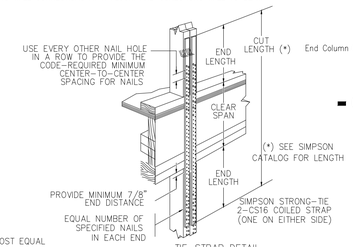
PLYWOOD FLOOR DECK:

1. PLYWOOD SHALL BE 1 1/8" THICKNESS AND SHALL BE RATED STURO–I–FLOOR (2–4–1) EXPOSURE 1.
2. PAY PENELS IN A STAGGARED PATTERN .
3. BLOCK ALL EDGES W/ 2–2x4 BLOCKING.
4. GLUE & NAIL TO FRAMING MEMBERS AS FOLLOWS:
   A. GLUE SHALL CONFORM TO APA SPE CIFICATION AF6–01, APPLIED IN A CONTINUOUS BEAD & IN ACCORDANCE WITH THE MANUFATURE'S RECOMMENDATION .
   B. ALL NAIL SHALL BE 8 13/16 RING OR SCREW SHANK . NAIL SPACING SHALL BE 4" O.C. @ PANEL EDGES & 12" O.C @ INTERMEDIATE SUPPORTS.

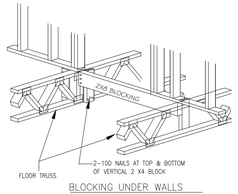
PRODUCT NAME / TRADE NAME / MANUFACTURER	PARALLEL STRAND LUMBER (PSL) "PARALLAM" McMILLAN BLOEDEL (ATHENS,GA, 30601) (WWW.FOREST.CA.COM)	LAMINATED STRUCTURAL LUMBER (LSL, GLULAM) "ANTHONY POWER BEAM" "ANTHONY FOREST PRODUCTS" (WWW. ANTHONYFOREST.COM) "CALVERT COMPANY,INC." (WWW. ANTHONYFOREST.COM)	LAMINATED VENEER LUMBER (LVL) "VERSA – LAM" BOISE CASCADE (WWW.BC.COM) "MICROLLAM" (WWW.TRUSJOIST.COM)
FLEXURAL STRESS: (Fb)	2,900 PSI	3,000 PSI	2,640 PSI
HORIZ. SHEAR STRESS: (Fv)	290 PSI	290 PSI	285 PSI
MODULUS OF ELASTICITY: (E)	2,000,000 PSI	2,100,000 PSI (W/CALLER TO OFFSET DEFLECTION))	2,000,000 PSI

MINIMUM END LENGTH	MIN. NUMBER OF NAILS (EACH END)	STRAP SPACING
18"± 1ST TO 2ND FLOOR	(8)–10d COMMON	42" o.c.
10"± APB TO 1ST FLOOR	(8)–10d COMMON	32" o.c.

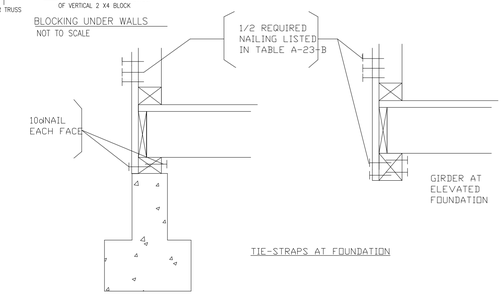
THIS DETAIL MUST BE USED AT ALL EXTERIOR, WALL TO WALL CONNECTIONS AT A FLOOR. AND CONECTIONS WALL TO BEAM



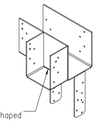
TIE–STRAP DETAIL



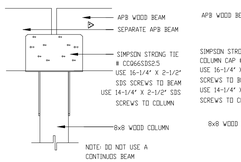
BLOCKING UNDER WALLS
NOT TO SCALE



TIE–STRAPS AT FOUNDATION

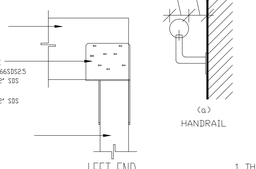


-02- TYPICAL POST TO BEAM CONNECTION DETAIL
SCALE: NTS.



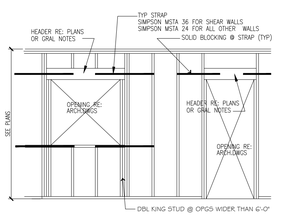
BEAM TO 8x8 COL
NOT TO SCALE

-03- TYPICAL POST TO BEAM CONNECTION DETAIL
SCALE: NTS.

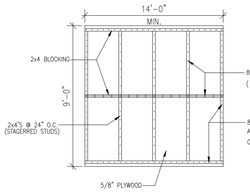


LEFT END
RIGHT END
NOTE:

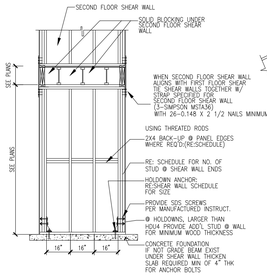
-04- TYPICAL POST TO BEAM CONNECTION DETAIL
SCALE: NTS.



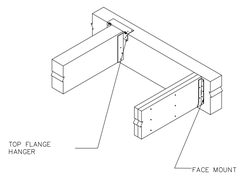
TYP STRAPPING @ SHEAR WALL
NOT TO SCALE

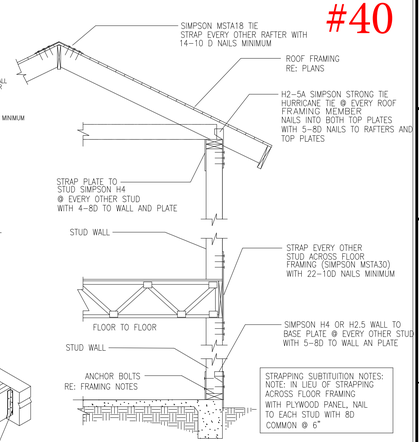


SHEAR WALL
SCALE : N.T.S.



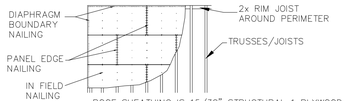
TYP SHEAR WALL ELEV.



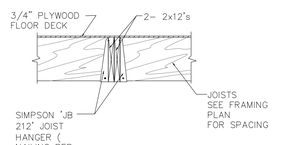


RIDGE & HIP STRAPPING
NOT TO SCALE

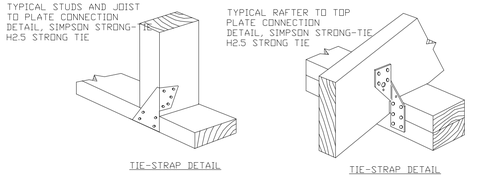
05- **TYPICAL BEAM TO BEAM CONNECTION**
SCALE: NTS.



DETAIL FLOOR/ROOF SHEATHING ATTACHMENT
SCALE: N.T.S.

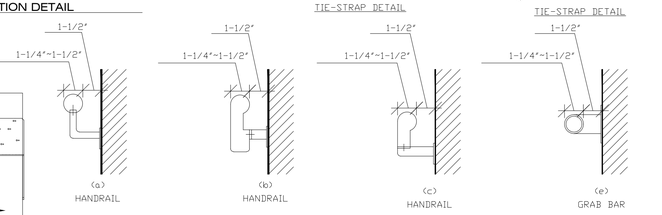


TYPICAL DETAIL
SCALE : N.T.S



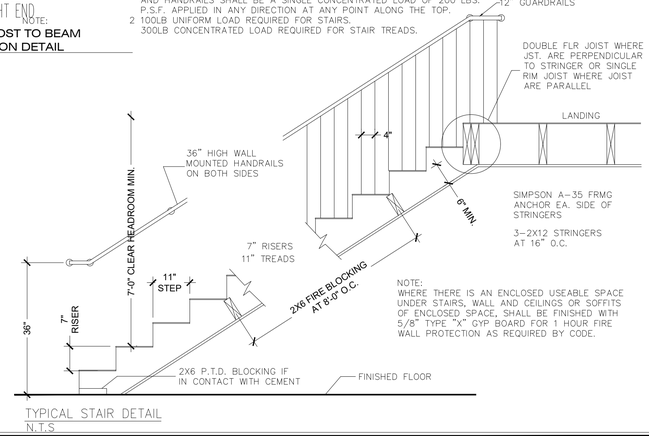
TIE–STRAP DETAIL

TIE–STRAP DETAIL



NOMINAL SIZE AND SPACING OF HANDRAILS AND GRAB BARS

1 THE MINIMUM UNIFORMLY DISTRUBUTED LIVE LOADS FOR GUARDRAILS, AND HANDRAILS SHALL BE A SINGLE CONCENTRATED LOAD OF 200 LBS. P.S.F. APPLIED IN ANY DIRECTION AT ANY POINT ALONG THE TOP.
2 100LB UNIFORM LOAD REQUIRED FOR STAIRS, 300LB CONCENTRATED LOAD REQUIRED FOR STAIR TREADS.



NOTE:
WHERE THERE IS AN ENCLOSED USEABLE SPACE UNDER STAIRS, WALL AND CEILINGS OR SOFFITS OF ENCLOSED SPACE, SHALL BE FINISHED WITH 5/8" TYPE "X" GYP BOARD FOR 1 HOUR FIRE WALL PROTECTION AS REQUIRED BY CODE.

TYPICAL STAIR DETAIL
N.T.S

ARCHITECT

CONTRACTOR

FIRM

Sarah Structural a Civil, LLC
Sarah Structural & Civil, LLC
13831 Northwest Freeway, Suite 245
Houston Texas 77040 (832) 922-1145
Office: (713) 485-5641

ENGINEER

COLORADO LICENSED
KARIN S. WADDELL
57999
PROFESSIONAL ENGINEER
04-10-2023

ISSUED FOR:
☐ DESIGN DEVELOPMENT
☐ PROGRESS 10 %
☐ BIDDING
☐ PERMIT
☒ CONSTRUCTION DOCUMENT
☐ CLIENT

REVISION | DATE

SINGLE-FAMILY RESIDENCE
311 Wagon Rd, Blue River, CO 80424

PROJECT LOCATION:

Framing Typical Details

SHEET TITLE:

DATE: 04/10/2023

SHEET
S-6

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address: 311 Wagon Rd, Blue River, CO 80424, Statele Unite ale Americii

Coordinates: 39.4575863, -106.0331066

Elevation: 9846 ft

Timestamp: 2023-03-30T18:14:14.930Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	77 mph
MRI 25-Year	83 mph
MRI 50-Year	88 mph
MRI 100-Year	92 mph
Risk Category I	100 mph
Risk Category II	105 mph
Risk Category III	112 mph
Risk Category IV	115 mph

ASCE 7-10

MRI 10-Year	76 mph
MRI 25-Year	84 mph
MRI 50-Year	90 mph
MRI 100-Year	96 mph
Risk Category I	105 mph
Risk Category II	115 mph
Risk Category III-IV	120 mph

ASCE 7-05

ASCE 7-05 Wind Speed	90 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

#42

A TOPOGRAPHIC MAP OF

LOT 14, THE SPILLWAY FILING No. 1

SECTION 7, TOWNSHIP 7 SOUTH, RANGE 77 WEST OF THE 6TH P.M.

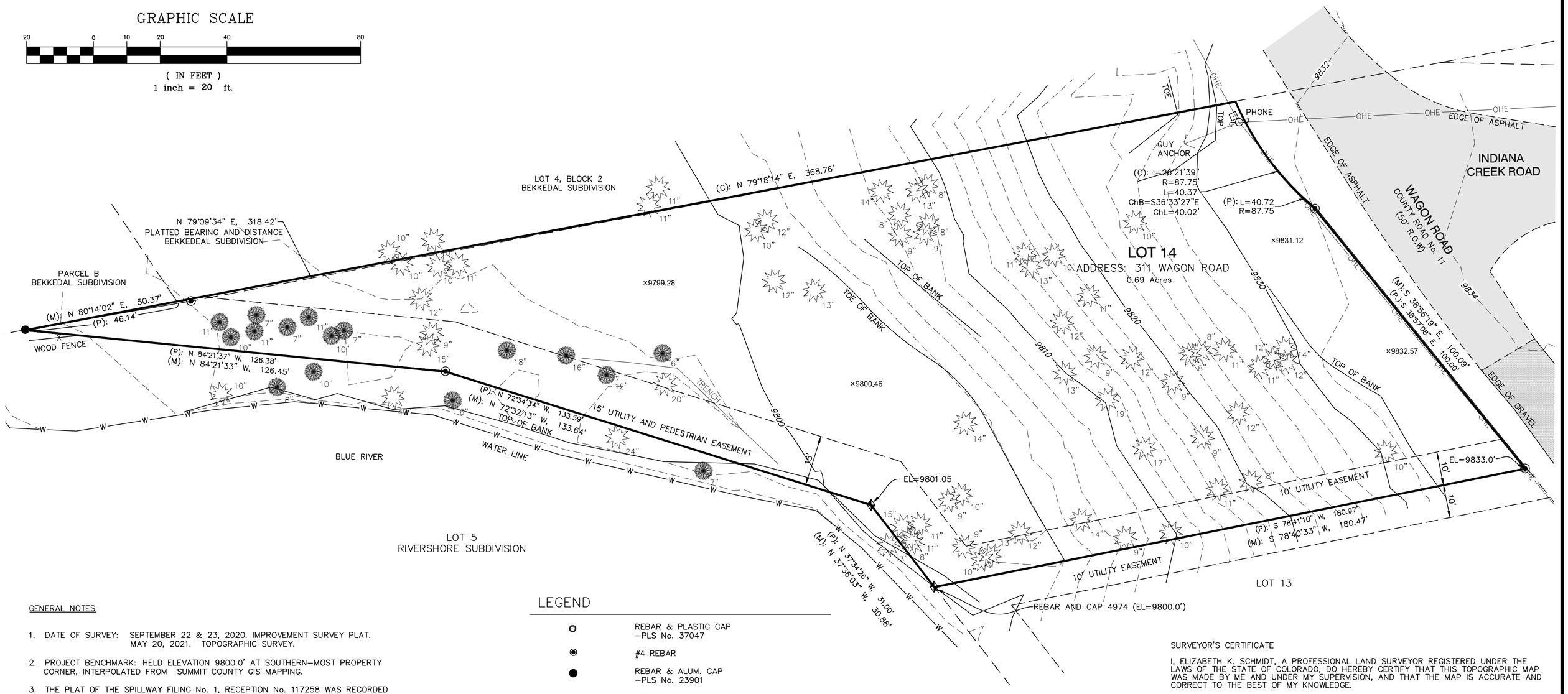
TOWN OF BLUE RIVER , SUMMIT COUNTY, COLORADO

NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



GENERAL NOTES

1. DATE OF SURVEY: SEPTEMBER 22 & 23, 2020. IMPROVEMENT SURVEY PLAT.
   MAY 20, 2021. TOPOGRAPHIC SURVEY.
2. PROJECT BENCHMARK: HELD ELEVATION 9800.0' AT SOUTHERN-MOST PROPERTY CORNER, INTERPOLATED FROM SUMMIT COUNTY GIS MAPPING.
3. THE PLAT OF THE SPILLWAY FILING No. 1, RECEPTION No. 117258 WAS RECORDED AUGUST 26, 1970 IN THE SUMMIT COUNTY CLERK AND RECORDER'S OFFICE.
4. LOT 14 IS SUBJECT TO THE NOTES, DEDICATIONS AND EASEMENTS AS SHOWN ON THE PLAT OF THE SPILLWAY, FILING No. 1.
5. BASIS OF BEARING: THE FOUND MONUMENTS AT THE SOUTHEAST AND SOUTHWEST PROPERTY CORNERS OF LOT 14.
6. SCHMIDT LAND SURVEYING, INC. DID NOT PERFORM A TITLE SEARCH OF THE SUBJECT PROPERTY TO ESTABLISH OWNERSHIP, EASEMENTS OR RIGHTS-OF-WAY OF RECORD. DOCUMENTS USED IN THE PREPARATION OF THIS SURVEY WERE PROVIDED BY TITLE COMPANY OF THE ROCKIES, ORDER NUMBER 1016244-C DATED AUGUST 26, 2020.

NOTICE:
ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT, MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF CERTIFICATION SHOWN HEREON.

LEGEND

○	REBAR & PLASTIC CAP –PLS No. 37047
◉	#4 REBAR
●	REBAR & ALUM. CAP –PLS No. 23901
◆	REBAR & PLASTIC CAP –PLS No. 4974
(P):	PLATTED BEARING AND DISTANCE
(M):	MEASURED BEARING AND DISTANCE
(C):	COMPUTED BEARING AND DISTANCE
⊂O⊃	UTILITY POLE
⊡	UTILITY PEDESTAL
——OHE——	OVERHEAD ELECTRIC LINE
——W——W——	WATERLINE
3"	PINE TREE WITH TRUNK DIAMETER
3"	SPRUCE TREE WITH TRUNK DIAMETER

SURVEYOR'S CERTIFICATE

I, ELIZABETH K. SCHMIDT, A PROFESSIONAL LAND SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS TOPOGRAPHIC MAP WAS MADE BY ME AND UNDER MY SUPERVISION, AND THAT THE MAP IS ACCURATE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

DATE: _____

Elizabeth Schmidt
_____
ELIZABETH K. SCHMIDT
COLORADO P.L.S. 37047

Drawn BNT/TMB	Dwg 2428 TP.dwg	Project 2428
Date 6/10/21	Scale 1" = 20'	Sheet 1 of 1

SCHMIDT
LAND SURVEYING, INC.
P.O. Box 5761
FRISCO, CO 80443 970-409-9963

#43

Rose-Villacorte Architecture LLC
346-498-3808
www.rvaarch.com

April 20, 2023

VIA: Blue River City Portal Submission

Landyn Hackebeil
Texas Traditions Designs & Renovations
43485 INTERSTATE 10 W
Boerne, TX 78006

Re: Building Permit Application for 0311 Wagon Road, Blue River CO, 80424

Dear: Building Permit Reviewers,

The Material/Color Samples have not been selected at this time. Please consider this portion of the application as a deferred submittal.

If you have any questions, please email or call me.

Sincerely

Timothy P. Rose

Timothy Rose, Registered Architect
TX # 26947, CO # 00406141, OK # a7508, ID # AR-986903,
VT # 003.0134390, NH # 05013, ME # ARC5319, MD # 21078
timothy@rvaarch.com
346-498-3808
www.rvaarch.com