

GENERAL NOTES:

1. PROJECT STANDARDS AND DOCUMENTS:
 - a. NESC 2023.
 - b. BICSI OSP DESIGN REFERENCE MANUAL 2018.
 - c. BICSI G1-17, ITC OUTSIDE PLANT CONSTRUCTION AND INSTALLATION: GENERAL PRACTICES.
 - d. BICSI G2.2-22 ITC OUTSIDE PLANT CONSTRUCTION AND INSTALLATION: AERIAL CABLE INSTALLATION.
 - e. BICSI G4-23: ITC OUTSIDE PLANT CONSTRUCTION AND INSTALLATION: DIRECT BURIED.
 - f. ANSI/TIA/EIA-568.3 OPTICAL FIBER CABLING COMPONENTS STANDARD.
2. ALL CONSTRUCTION ACTIVITIES PERFORMED MUST MEET ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES, REGULATIONS, RULES, STATUTES, ORDINANCES, AND LAWFUL ORDERS. ALL APPLICABLE OSHA, INDUSTRY, AND COMPANY SPECIFIC SAFETY GUIDELINES AND PROCEDURES ARE TO BE FOLLOWED IN THE EXECUTION OF THIS WORK.
3. THE PLANNED ROUTES AND DESIGN DETAILS ARE PROVIDED AS SCHEMATICS OR GUIDELINES TO ACHIEVE THE DESIRED RESULTS. MINOR MODIFICATIONS MAY BE REQUIRED DUE TO THE FIELD CONDITIONS FOUND ON LOCATION AND ARE ASSUMED TO BE PART OF THE CONSTRUCTION SCOPE OF WORK (SOW). ANY REQUIRED FIELD MODIFICATIONS, ALTERATIONS OR DEVIATIONS TO THE DESIGN OR MATERIALS SPECIFIED SHALL BE APPROVED IN ADVANCE BY THE CONSTRUCTION MANAGER AND THE PROJECT ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
 - a. IN AREAS WHERE CONSTRUCTION IS TAKING PLACE IN AN EASEMENT OR ROW A SURVEY IS TO BE COMPLETED TO ENSURE COMPLIANCE WITH ANY VARIATIONS TO THE PLANS.
 - b. IN ANY PROTECTED AREAS THE AUTHORITY HAVING JURISDICTION (AHJ) IS TO APPROVE ALL CHANGES PRIOR TO EXECUTION OF THE MODIFIED WORK AREA.
 - c. ALL PATH VARIATIONS ARE TO BE REDLINED ON THE PLANS AND TURNED IN AS PART OF THE CONSTRUCTION SUBMITTALS.
4. ALL WORK IS TO BE PERFORMED BY, OR UNDER THE DIRECT SUPERVISION OF A JOURNEYMAN LEVEL CRAFT PERSON WITH APPLICABLE EXPERIENCE AND EXPERTISE IN THE TECHNICAL AND CONSTRUCTION FIELDS REQUIRED TO EXECUTE THE SOW.
5. ALL EQUIPMENT AND MATERIALS UTILIZED SHALL BE NEW, FREE OF DEFECTS, AND FIT FOR PURPOSE FOR THE LOCAL ENVIRONMENTAL CONDITIONS IN WHICH THEY ARE UTILIZED. THEY ARE TO BE STORED, TRANSPORTED, INSPECTED, PREPARED, AND INSTALLED FOLLOWING THE MANUFACTURER'S INSTRUCTIONS AND INDUSTRY RECOMMENDATIONS FOR USE. BULK FIBER OPTIC CABLES SHALL BE FIELD TESTED WITH AN OTDR ON THE REEL PRIOR TO INSTALLATION.
6. ALL CONSTRUCTION, ENVIRONMENTAL, AND LAND-USE PERMITS REQUIRED FOR THE STORAGE, STAGING AND EXECUTION OF THIS SOW, ARE TO BE CONFIRMED TO BE IN PLACE PRIOR TO THE START OF WORK.
7. ALL AERIAL PHOTOGRAPHY AND COMPASS DIRECTIONS ARE FOR GEOGRAPHIC REFERENCE ONLY. ALL PATHWAY, ROW AND EASEMENTS ARE TO BE SURVEYED AND STAKED BY A LICENSED SURVEYOR PRIOR TO CONSTRUCTION.
 - a. ALL DESIGNS WITH ROADWAYS WERE DEVELOPED USING THE ALASKA DEPARTMENT OF TRANSPORTATION (ADOT) PROVIDED CENTER LINE GIS MAPS AND ARE ASSUMED TO BE ACCURATE. ALL MEASUREMENTS ARE FROM THE CENTER LINE OUT.
 - b. ALL PRIVATE PROPERTY CROSSINGS WILL REQUIRE EASEMENTS. ASSOCIATED PLAT MAPS AND PROPERTY INFORMATION CAN BE FOUND IN THE APPENDIX SECTION OF THE DRAWINGS.
 - c. CONSTRUCTION SURVEY ACCURACY FOR STAKING AND VERIFICATION.
 - i. HORIZONTAL ACCURACY: ±0.5 FT

ii. VERTICAL ACCURACY: ±0.2 FT

iii. METHODS: GNSS RTK, TOTAL STATION, OR APPROVED EQUIVALENT.

CIVIL WORKS:

1. CONTRACTORS ARE RESPONSIBLE FOR CONTACTING THE ALASKA 811 DIG LINE PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. FOR THE RURAL COMMUNITIES UNDER THIS SCOPE, A MINIMUM OF 10 DAYS' ADVANCE NOTICE IS REQUIRED. CONTRACTOR IS ALSO RESPONSIBLE FOR DIRECTLY CONTACTING LOCAL GAS, WATER, TELEPHONE, AND ELECTRICAL UTILITY COMPANIES TO ENSURE ALL BURIED UTILITIES ARE LOCATED AS THESE COMPANIES MAY NOT PARTICIPATE IN THE 811 PROGRAM.
 - a. FOR ALL BORING OPERATIONS AT OR NEAR LOCATED UTILITIES CONTRACTOR IS TO POTHOLE AT POINTS OF CROSSING.
 - b. CONTRACTOR IS TO PROVIDE GEO LOCATIONS FOR ALL UTILITY CROSSINGS TO INCLUDE SERVICE TYPE AND DEPTH.
2. ANY DEVIATIONS FROM THE PLANNED ROUTES AND METHODS ARE TO BE DOCUMENTED AND APPROVED BY THE CONSTRUCTION MANAGER AND THE PROJECT ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
 - a. IN AREAS WHERE CONSTRUCTION IS TAKING PLACE IN AN EASEMENT OR ROW A SURVEY IS TO BE COMPLETED TO ENSURE COMPLIANCE FOR ANY VARIATIONS TO THE PLANS.
 - b. IN ANY PROTECTED AREAS THE AHJ IS TO APPROVE ALL CHANGES PRIOR TO EXECUTION OF THE MODIFIED WORK AREA.
 - c. ALL PATH VARIATIONS ARE TO BE REDLINED ON THE PLANS AND TURNED IN AS PART OF THE CONSTRUCTION SUBMITTALS.
3. CONSTRUCTION AND STORM WATER PERMITS
 - a. CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO THE START OF WORK
 - b. CONTRACTOR WILL HAVE AN APPROVED STORM WATER RUNOFF CONTROL PLAN (SWPPP) IN PLACE
 - i. CONTRACTOR IS TO PROVIDE AND MAINTAIN ALL RUNOFF, EROSION, AND DUST CONTROL DEVICES PER THE ASSOCIATED PROJECT SWPPP.
 - ii. DEWATERING OF PITS AND TRENCH WORKS MAY BE REQUIRED AND FOLLOW ADEC REQUIREMENTS
 - c. ALL PERMITS SHALL BE CLOSED OUT AFTER COMPLETION OF WORK.
4. CONTAMINATED SOILS
 - a. PRIOR TO COMMENCING WORK THE CONTRACTOR WILL:
 - i. REVIEW THE SITE RECORDS FOR DOCUMENTED AREAS OF CONTAMINATION.
 - ii. PERFORM A "WALKDOWN" OF THE JOB SITE FOR SUSPECTED OR OBSERVED CONTAMINATION.



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PROJECT NO. TCC00011	SIZE 11 x 17	DESIGN AND CONSTRUCTION GENERAL NOTES
SGV DOC. NO. TCC00011_TC_AL_MSYS_DCN_25CM0574		
CREATED BY MARKUS KOFOID	DATE 4/1/25	
DRAWN BY MARKUS KOFOID	DATE 4/1/25	
CHECKED BY JEREMY JOHNSON	DATE 4/1/25	
APPROVED BY KEITH MERRICK	DATE 4/1/25	GN-1

Esri, NASA, NGA, USGS, FEMA, State of Alaska, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar

CIVIL WORKS:

- b. IF CONTAMINATED SOILS ARE FOUND DURING EXECUTION OF THE PROJECT, THE CONTRACTOR WILL STOP WORK AND NOTIFY THE APPROPRIATE AGENCIES
- c. THE CONTRACTOR WILL OPERATE UNDER A SPILL MITIGATION PLAN AND REPORT ANY SPILLS
- 5. CULTURALLY SENSITIVE AREA AWARENESS:
 - a. WORKING IN REMOTE LOCATIONS IT IS POSSIBLE TO ENCOUNTER ENVIRONMENTAL, HISTORICAL, OR CULTURALLY SENSITIVE ITEMS SUCH AS; ENDANGERED SPECIES, CRITICAL HABITAT, ABORIGINAL BURIAL SITES, ENCAMPMENTS, PETRIFIED BONES, OR OTHER ARTIFACTS.
 - i. PRE-IDENTIFIED SENSITIVE AREAS MAY REQUIRE CONTINUOUS MONITORING OF THE EXCAVATED SPOILS FOR ITEMS OF CULTURAL OR HISTORICAL SIGNIFICANCE.
 - ii. IN THESE CASES, MONITORING OF SPOILS IS TO BE PERFORMED BY A TRAINED AND CERTIFIED 3RD/ PARTY AS DIRECTED BY THE AHJ.
 - iii. CLEARING, GRUBBING, OR CONSTRUCTION ACTIVITIES MAY BE LIMITED DURING CERTAIN PERIODS BY NESTING, DENNING, OR BURROWING ACTIVITIES ALONG OR ADJACENT TO THE SELECTED ROUTES
 - b. IT IS THE DUTY OF THE CONTRACTOR TO STOP ALL WORK AT THE LOCATION AND REPORT ANY ARTIFACTUAL FINDINGS TO THE PROJECT OWNER AND THE AHJ.
- 6. CONSTRUCTION WASTE, CLEARING DEBRIS, AND EXCAVATION SPOILS
 - a. CONTRACTOR IS TO KEEP THE SITE CLEAR FROM ACCUMULATING CONSTRUCTION WASTE, ROCKS, EXCAVATION SPOILS, AND DEBRIS
 - b. SUCH MATERIAL IS TO BE REMOVED FROM THE SITE AT REGULAR INTERVALS AND DISPOSED OF LEGALLY
 - c. ALL BRUSH AND TREES LESS THAN 6-INCHES IN DIAMETER BEING REMOVED FROM THE CABLE ROUTE ARE TO BE CHIPPED AND DISPOSED OF PER THE CONSTRUCTION MANAGER
 - d. TREES GREATER THAN 6-INCHES ARE TO BE CUT INTO SIX FOOT LENGTHS AND STACKED IN A SUITABLE LOCATION PER THE CONSTRUCTION MANAGER
- 7. STANDARD DEPTHS AND COVER:
 - a. ALL BURIED PATHS ARE TO MAINTAIN A MINIMUM OF 18" VERTICAL SEPARATION FROM ALL OTHER BURIED UTILITIES.
 - b. BURIED DUCT RUNNING PARALLEL WITH A CITY ROAD OR STREET AND BURIED INSIDE OF THE ROW AND OUTSIDE OF THE ROAD ENVELOPE: 24"-36" DEPTH OR AS DICTATED BY THE PERMIT
 - c. BURIED DUCT RUNNING PARALLEL WITH A STATE HIGHWAY AT A DISTANCE GREATER THAN 10' FROM THE EDGE OF ROAD ENVELOPE OR INSIDE OF THE ROW: 36"-48" DEPTH OR AS DICTATED BY THE PERMIT.
 - d. BURIED DUCT CROSSING PERPENDICULAR TO A ROADWAY IS TO BE AT A DEPTH OF 48" FOR 10' BEFORE, AFTER, AND ACROSS THE ROAD SURFACE.
 - e. BORED WATER CROSSINGS SHALL:
 - i. STREAMS AND FLOWING WATERS: MAINTAIN A DEPTH OF 10' BELOW THE BOTTOM OF THE DEEPEST SCOUR.
 - ii. PONDS AND OTHER NON-FLOWING WATERS: MAINTAIN A DEPTH OF 5' BELOW THE BOTTOM OF THE BODY OF WATER.
 - iii. ENSURE ALL CABLE VAULTS AND/OR MHS ARE INSTALLED 50' OR MORE AWAY FROM THE EDGE OF THE BODY OF WATER IN

- FLOODED CONDITION.
- iv. HAVE NO DISTURBANCE OF TOPSOIL WITHIN 25' FROM EITHER SIDE OF THE STREAM BANK.
- v. CONTRACTOR IS TO ADHERE TO ADEC REGULATIONS FOR DIRECTIONAL BORING.
- 8. TRENCHING METHODS
 - a. TRENCHING SHALL BE PERFORMED USING MECHANICAL OR VACUUM EQUIPMENT SUITABLE FOR EXISTING SOIL CONDITIONS, MAINTAINING REQUIRED DEPTH AND ALIGNMENT. TRENCH WIDTH SHALL ALLOW FOR PROPER CONDUIT SEPARATION, COMPACTION, AND BEDDING (TYPICALLY A MINIMUM OF 6 INCHES ON EACH SIDE OF THE CONDUIT).
 - b. FOR AREAS WITH IMPROVED SURFACES, ALL PAVEMENT OR CONCRETE SHALL BE SAW-CUT PRIOR TO EXCAVATION. RESTORATION SHALL MATCH ORIGINAL COMPACTION AND SURFACE MATERIAL/THICKNESS, IN ACCORDANCE WITH LOCAL OR PERMITTING AUTHORITY REQUIREMENTS.
 - c. SPOIL MATERIAL SHALL BE STOCKPILED NEATLY AND KEPT CLEAR OF ROADS, DRIVEWAYS, AND DRAINAGEWAYS. EXCESS MATERIAL SHALL BE REMOVED FROM THE SITE OR REUSED AS APPROPRIATE FOR BACKFILL.
 - d. DUST CONTROL, EROSION MITIGATION, AND DEWATERING MEASURES SHALL BE EMPLOYED DURING ALL TRENCHING OPERATIONS.
- 9. SHORING OF TRENCH AND PIT WALLS
 - a. TRENCH AND EXCAVATION SIDEWALLS MUST REMAIN STABLE; SHORING OR SLOPING SHALL BE USED AS REQUIRED BY OSHA STANDARDS.
 - b. UTILIZE TRENCH BOXES AND EGRESS LADDERS WHERE APPROPRIATE
- 10. OPEN TRENCHES AND PITS
 - a. MONITOR, GUARD, AND PROTECT ALL OPEN EXCAVATIONS FROM INCIDENTAL TRAFFIC
 - b. DO NOT LEAVE TRENCH WORKS OR EXCAVATIONS OPEN OVERNIGHT
- 11. BEDDING OF HDPE RACEWAY AND CABLES
 - a. HDPE CONDUIT AND DIRECT-BURIED FIBER SHALL BE BEDDED IN A MINIMUM OF 6-INCHES OF CLEAN, 3/8" MINUS SCREENED NATIVE SOIL OR IMPORTED SAND, FREE OF ROCKS, COBBLES, DEBRIS, OR ORGANIC MATERIAL. CONDUIT SHALL REST ON A UNIFORMLY COMPACTED TRENCH BOTTOM. AFTER PLACEMENT, BACKFILL WITH AN ADDITIONAL 6-INCHES OF THE SAME MATERIAL AND COMPACT TO 90% STANDARD PROCTOR.
 - b. TWIST AND RISES IN THE HDPE CONDUIT SYSTEM ARE TO BE RESOLVED PRIOR TO BACKFILL



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CHECKED BY JEREMY JOHNSON	DATE 4/1/25	
APPROVED BY KEITH MERRICK	DATE 4/1/25	GN-2

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CIVIL WORKS:

12. LOCATING AND DETECTION
 - a. SCARE OR WARNING TAPE IS TO BE PLACED WITHIN 12" OF THE FINAL GRADE SURFACE ABOVE ALL RACEWAY THAT IS PLACED USING TRENCH OR PLOW INSTALLATION PRACTICES.
 - b. SCARE OR WARNING TAPE IS TO HAVE METALLIC BACKING DESIGNED TO BE LOCATED WITH A COMMON METAL DETECTOR.
 - c. A CONTINUOUS NUMBER 12AWG COPPER CONDUCTOR IS TO BE PLACED IN A MINIMUM OF ONE OF THE DUCTS INSTALLED FOR EACH SPAN OF BURIED DUCT.
13. BURIED CABLE PLANT MARKERS
 - a. A WEATHER RESISTANT REINFORCED POLYMER FIBER MARKER IS TO BE PLACED ABOVE ALL BURIED PATHWAY.
 - b. MARKERS ARE TO BE PLACED AS FOLLOWS:
 - i. WITHIN 20' OF EACH SIDE OF A ROAD OR TRAIL CROSSING.
 - ii. IF RUNNING PARALLEL TO A ROAD OR TRAIL SURFACE A MARKER IS TO BE PLACED EVERY 250'.
 - iii. IF RUNNING IN A RURAL AREA OR IN OPEN SPACE A MARKER IS TO BE PLACED EVERY 500'.
 - iv. A MARKER IS TO BE PLACED AT ALL VAULTS/HANDHOLES.
 - c. MARKER IS TO HAVE A REFLECTIVE IDENTIFICATION STICKER AFFIXED TO THE MARKER. THE STICKER SHOULD CALL OUT "BURIED FIBER" AND BEAR THE "ALASKA DIG LINE" NUMBER AS WELL AS CONTACT INFORMATION FOR THE OWNER OF THE FIBER.
 - d. MARKERS ARE TO BE INSTALLED SUCH THAT 36"-44" OF THE POST IS EXPOSED.
14. TRAFFIC CONTROL:
 - a. THE CONTRACTOR IS RESPONSIBLE FOR:
 - i. OBTAINING ALL TRAFFIC CONTROL PERMITS FROM THE AHJ PRIOR TO START OF SITE WORK
 - ii. INSTALLING AND MAINTAINING ALL REQUIRED SIGNAGE, BARRICADES, OR COVERS
 - iii. PROVIDING FLAGGERS WHERE REQUIRED AT ROAD CROSSINGS OR ADJACENT TO ROAD ALIGNMENTS
15. FINAL GRADE AND DRAINAGE
 - a. TRENCHES SHALL BE BACKFILLED AND COMPACTED TO MATCH EXISTING GRADE UNLESS OTHERWISE SPECIFIED. FINAL GRADE SHALL PROMOTE POSITIVE DRAINAGE AWAY FROM STRUCTURES, HANDHOLES, AND ACCESS POINTS. ENSURE NO LOW SPOTS OR DEPRESSIONS REMAIN THAT MAY CAUSE WATER POOLING. ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER, WITH APPROPRIATE SURFACE TREATMENT (E.G., GRAVEL, VEGETATION, PAVING) AS REQUIRED.
 - b. TRENCH ROUTES ACROSS UNDEVELOPED AREAS ARE BE COVERED AND MOUNDED WITH 2-INCHES NATIVE SOIL FREE OF ROCKS AND COBBLES, PRIOR TO REVEGETATION.
16. RESTORATION
 - a. CONTRACTOR IS TO SEED ALL DISTURBED TOPSOIL WITH NATIVE GRASS SEED. IN AREAS WHERE THE SLOPE IS GREATER THAN 15% HYDRO SEED OR GRASS MAT MUST BE INSTALLED OR GREATER IF PERMIT REQUIRES.
 - b. ROAD CROSSING TRENCH BACKFILL SHOULD BE BACKFILLED IN 6" LIFTS BEING COMPACTED TO 95% OF THE MAXIMUM DENSITY FOR THE MATERIAL. THE ROAD SURFACE SHOULD BE RESTORED WITH LIKE MATERIAL, IF SURFACE IS NOT PAVED ALL

- MATERIAL IS TO BE COMPACTED TO 95%. ALL BACKFILL INSIDE OF THE ROAD PRISM IS TO BE TESTED AND SUBMITTED AS PART OF THE CONSTRUCTION SUBMITTALS.
- c. ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION UPON COMPLETION OF CONSTRUCTION. RESTORATION INCLUDES REGRADING, COMPACTION, SURFACE REPLACEMENT (E.G., GRAVEL, ASPHALT, VEGETATION), AND REMOVAL OF EXCESS MATERIALS. WORK AREAS SHALL BE CLEANED OF DEBRIS, AND ACCESS ROUTES RETURNED TO PRE-CONSTRUCTION CONDITION. RESTORATION MUST COMPLY WITH LOCAL AGENCY AND LANDOWNER REQUIREMENTS.
 - d. RESEEDING OR SUBSIDENCE OF THE COVER SOILS ALONG THE TRENCH ROUTE AFTER THE FIRST FREEZE-THAW CYCLE ARE TO BE ADDRESSED WITHIN THE FOLLOWING SEASON

OUTSIDE PLANT CABLE SYSTEM:

1. STANDARD CLEARANCES.
 - a. ALL BURIED HDPE RACEWAY/DUCT, CONDUITS, AND FOC CABLES ARE TO FOLLOW NESC AND INDUSTRY STANDARDS FOR ALIGNMENT, CLEARANCES, AND DEPTHS OF BURY:
 - i. BURIED POWER: MAINTAIN A HORIZONTAL MINIMUM SEPARATION OF 36"
 - ii. WATER AND SEWER: MAINTAIN A HORIZONTAL MINIMUM SEPARATION OF 18"
 - iii. OTHER UTILITIES: MAINTAIN A HORIZONTAL MINIMUM SEPARATION OF 18"
 - b. ALL AERIAL HDPE RACEWAY/DUCT AND FOC CABLES ARE TO FOLLOW NESC AND INDUSTRY STANDARDS FOR ALIGNMENT AND CLEARANCES:
 - i. PRIMARY AERIAL FOC SHALL BE INSTALLED A MINIMUM OF 40" BELOW THE NEUTRAL OF A PRIMARY LINE AND 30" BELOW A SECONDARY LINE. MID SPAN SEPARATION IS TO BE NO LESS THAN 75% OF THE SEPARATION AT THE POLE.
 - ii. ALL FOC IS TO HAVE A MINIMUM CLEARANCE FROM THE GROUND OF 18'-0" AT ITS LOWEST POINT. (ADDITIONAL CLEARANCE MAY BE REQUIRED FOR CROSSING SEASONAL MOTOR VEHICLE ICE-ROADS WHERE PERMITTED)
 - iii. AERIAL SERVICE DROPS ARE TO BE INSTALLED SUCH THAT THE LOWEST POINT OF DROOP IS NOT LESS THAN 10' FROM THE GROUND. NOTE IF THE DROP CROSSES A ROADWAY THE GROUND CLEARANCE MUST BE A MINIMUM OF 16' AT THE LOWEST POINT.
- c. WATER LAID FOC- REQUIREMENTS PER ATTACHED DRAWINGS BASED ON INDIVIDUAL LOCATIONS.



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OUTSIDE PLANT CABLE SYSTEM:

2. HDPE RACEWAY/DUCT SCHEDULE U.N.O. (UNLESS NOTED OTHERWISE):
 - a. ALL BORED PATHWAY IS TO BE QUANTITY TWO, 2" NOMINAL ID HDPE RACEWAY
 - b. ALL TRENCHED/PLOWED PATHWAY IS TO BE TWO, 2" NOMINAL ID HDPE RACEWAY
 - c. ALL TRANSITIONS FROM BURIED TO AERIAL ARE TO LEVERAGE A 2" SCHEDULE 80 POLE RISER WITH A 24" MINIMUM BEND SWEEP.
 - d. ALL CONDUIT FROM A VAULT TO A SHELTER IS TO BE A MINIMUM OF QUANTITY TWO, 4" CONDUITS.
 - i. PATHWAY IS TO BE CONSTRUCTED SUCH THAT THERE IS NO MORE THAN 90 DEGREES OF VERTICAL TURN FROM THE VAULT TO THE SHELTER.
 - e. ALL UNDERGROUND HDPE CONDUITS ARE TO BE SEAMLESS ALONG THE ENTIRE LENGTH OF THE RUN. ANY REQUIRED CONDUIT SPLICE POINTS ARE TO BE LOCATED WITHIN PEDESTALS, CABLE VAULTS, OR MAINTENANCE-HOLES FOR EASE OF ACCESS.
 - f. ANY OPEN ENDS ARE TO BE IMMEDIATELY SEALED AND PROTECTED AGAINST DIRT, WATER, OR FOREIGN OBJECTS.
3. RACEWAY/DUCT PROOFING:
 - a. ALL CONDUIT AND DUCT PATHWAYS SHALL BE PROOFED END-TO-END WITH A MANDREL SIZED TO 80% OF THE INTERNAL DIAMETER PRIOR TO CABLE INSTALLATION. A FULL-LENGTH PULL STRING OR MULE TAPE WITH FOOTAGE MARKINGS SHALL BE INSTALLED AND SECURED IN EACH CONDUIT. DUCTS SHALL BE CLEAN, DRY, AND FREE OF OBSTRUCTIONS. DAMAGED OR OBSTRUCTED DUCTS MUST BE REPAIRED OR REPLACED PRIOR TO ACCEPTANCE.
 - b. ALL OPEN ENDS ARE TO BE SEALED TO PREVENT WATER INTRUSION INTO THE CABLE DUCT-WORKS.
 - c. ALL CONDUITS AND DUCTS ARE TO BE TAGGED AT EACH END IN ACCORDANCE WITH THE PROJECT DOCUMENTATION ASSIGNMENT
4. CABLE INSTALLATION
 - a. PROTECTED THE CABLE FROM DAMAGE OCCURRING DURING TRANSPORT, HANDLING, INSTALLATION, AND BACKFILL ACTIVITIES
 - b. SEAL AND PROTECT ALL CABLE ENDS
 - c. FOLLOW ALL MANUFACTURER GUIDELINES, INSTALLATION AND HANDLING TEMPERATURE, MINIMUM BEND RADIUS, AND PULL TENSION.
 - d. PREVENT EXCESSIVE BENDING OR KICKING OF THE CABLE DURING HANDLING AND FIGURE-8 COILING FOR SLACK MANAGEMENT
 - e. PREVENT OVER-TENSIONING OF THE CABLE BY UTILIZING TENSION METERS OR BREAK-AWAYS ON ALL CABLE PULLS
5. SLACK AND STORAGE REQUIREMENTS
 - a. ALL BURIED PLANT IS TO HAVE A MINIMUM OF 150' OF SLACK STORED WITHIN EACH BURIED VAULT
 - i. THE SLACK STORED WITHIN THE VAULT WILL BE IN A COIL AND SECURED
 - b. ALL AERIAL PLANT IS TO HAVE A MINIMUM OF A 150' SLACK LOOP ADJACENT TO EACH AERIAL ENCLOSURE
 - i. THE AERIAL SLACK IS TO BE STORED ON THE SPAN USING A "SNOWSHOE" STYLE FIBER STORAGE UNIT

6. ELECTRICAL GROUNDING AND BONDING
 - a. GENERAL:
 - i. FOR ALL CONDUCTIVE CABLE ASSEMBLIES UTILIZING ARMOR, BRAID, OR SHIELDED, THE EXPOSED METALLIC ELEMENTS ARE TO BE BONDED TO AN APPROPRIATE GROUNDING POINT.
 - b. VAULTS AND MAINTENANCE HOLES
 - i. ALL VAULTS ARE TO HAVE A 72" X 3/4" COPPER GROUND ROD INSTALLED PER ENGINEERING TYPICAL DRAWINGS.
 - ii. ALL NON-DIELECTRIC CABLES AND SYSTEM ELEMENTS ARE TO BE BONDED IF THE JACKET HAS BEEN OPENED.
 - c. AERIAL
 - i. ALL NEW INSTALLED STRAND, GUYS AND POLES ARE TO BE BONDED AS PER ASSOCIATED DETAILS AND INDUSTRY STANDARDS.
 - d. COMMUNICATIONS SHELTERS
 - i. THE CONDUCTIVE ELEMENTS OF A CABLE ENTERING A SHELTER ARE TO BE BONDED TO THE MAIN GROUND BAR AS PART OF THE SINGLE POINT GROUND SYSTEM FOR ALL SERVICES WITHIN THE COMMUNICATIONS FACILITY.
 - e. BUILDINGS
 - i. THE CONDUCTIVE ELEMENTS OF AN AERIAL OR UNDERGROUND CABLE TERMINATED AT THE BUILDING ARE TO BE BONDED TO THE MULTI-SERVICE GROUND BAR, GROUNDING CONDUCTOR, OR GROUND ROD AS PART OF THE SINGLE POINT GROUND SYSTEM FOR THE ELECTRICAL SERVICE.
7. FIBER TESTING
 - a. ALL FIBER IS TO BE TESTED WITH AN OTDR PRIOR TO INSTALLATION. FIBER TRACES ARE TO BE RECORDED AND SUBMITTED AS PART OF FINAL DOCUMENTATION.
 - b. ALL PLACED FIBER IS TO BE OTDR TESTED IN PLACE. THE FOLLOWING RESULTS ARE TO BE RECORDED AND SUBMITTED AS PART OF FINAL DOCUMENTATION:
 - i. BI-DIRECTIONAL OTDR TRACE.
 - ii. BI-DIRECTIONAL LIGHT METER LOSS TESTS FOR:
 1. 1310NM
 2. 1550NM
 3. 1625NM



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OUTSIDE PLANT CABLE SYSTEM:

iii. OTDR AND LOSS TEST RESULTS ARE TO BE SUBMITTED IN THE FILE FORMAT DETERMINED BY THE PROJECT ENGINEER

8. AS-BUILD DOCUMENTATION

a. CONTRACTOR SHALL PROVIDE ACCURATE AS-BUILT DOCUMENTATION SHOWING FINAL CONDUIT AND CABLE LOCATIONS, DEPTHS, POLES, RISERS, SPLICE POINTS, HANDHOLES, RELATED INFRASTRUCTURE, AND ALL DEVIATIONS FROM DESIGN. AS-BUILTS SHALL BE SUBMITTED IN BOTH PDF AND GIS-COMPATIBLE DIGITAL FORMAT WITHIN 30 DAYS OF CONSTRUCTION COMPLETION. SURVEY-GRADE GPS ACCURACY (± 0.1 FT) IS REQUIRED FOR ALL UNDERGROUND INFRASTRUCTURE.

b. DOCUMENTATION OUTPUT FORMAT

i. ANNOTATED PDF PLAN SET REFLECTING FINAL FIELD CONDITIONS

ii. GIS-COMPATIBLE DIGITAL FILES IN ESRI SHAPEFILE (.SHP), FILE GEODATABASE (.GDB), OR GEOJSON FORMAT

iii. COORDINATE SYSTEM SHALL BE NAD83 (DECIMAL-DEGREES) AND NAVD88 (US FEET)

iv. TABULAR ASSET INVENTORY IN EXCEL OR CSV FORMAT, LISTING ASSET ID, TYPE, LOCATION, AND ATTRIBUTES

c. SURVEY ACCURACY REQUIREMENTS (POST-CONSTRUCTION):

i. HORIZONTAL ACCURACY: ± 0.1 FT (NAD83)

ii. VERTICAL ACCURACY: ± 0.2 FT (NAVD88)

iii. ALL INFRASTRUCTURE SHALL BE LOCATED VIA OPEN-TRENCH OBSERVATION OR VERIFIED TRACER WIRE/VACUUM EXCAVATION.



4-Apr-2025 REV 01

REVISIONS					
REV. NO.	DATE	DESCRIPTION	BY	CHK	APR
1	4/4/25	ISSUE FOR CONSTRUCTION	MK	JJ	KM



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REV. NO

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SIZE 11 x 17

GENERAL INSTALLATION DETAILS

PROJECT NO. TCC00011

SGV DOC. NO. TCC00011_TC_AL_MSYS_DCN_25CM0574

CREATED BY MARKUS KOFOID

DATE 4/1/25

DRAWN BY MARKUS KOFOID

DATE 4/1/25

CHECKED BY JEREMY JOHNSON

DATE 4/1/25

APPROVED BY KEITH MERRICK

DATE 4/1/25

DESIGN AND CONSTRUCTION
GENERAL NOTES

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GN-5