SYMCO TOWER CONNECT

Project Owner:
Waupaca County
811 Harding St
Waupaca, WI 54981

Project Engineer:
Multimedia Communications & Engineering, Inc.
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Designed By:
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Permits Required:
County

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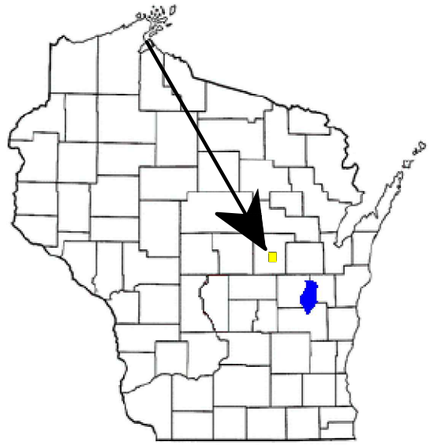
Project Location
City of Waupaca , WI

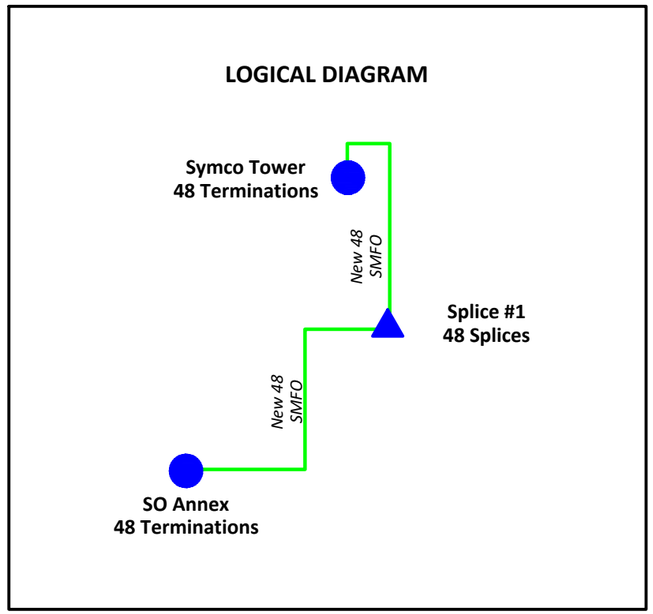


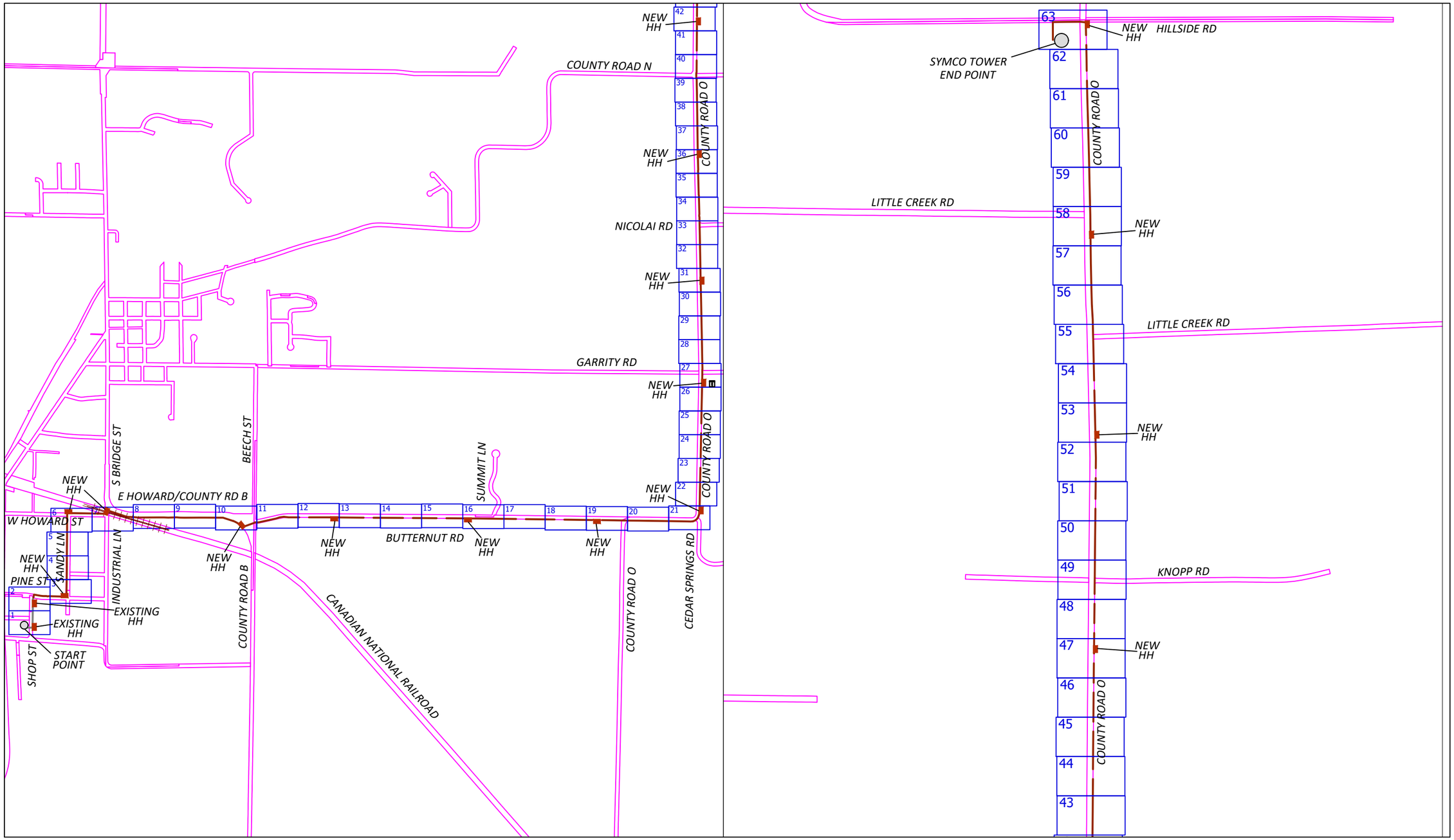
COORDINATE SYSTEM: Waupaca County , WI

Legend

- = Underground Fiber
- = Handhole
- = Locate Station
- = Telco
- = Cable TV
- = Electric
- = Gas
- = Water
- = Sanitary Sewer
- = Storm Sewer
- = Utility Pole
- = Fiber Ped
- = Traffic Control Box
- = Telco Ped
- = Cable TV Ped
- = Electric Ped
- = Electric Transformer
- = Catch Basin / Inlet
- = Round Catch Basin / Inlet
- = Manhole
- = Handhole
- = Utility Pole
- = Anchor
- = Aerial Fiber
- = Overhead Guy
- = Expansion Loop
- = Splice
- = Power Pole
- = Standoff
- = Culvert
- = Tree
- = Street Light
- = Water Valve
- = Fire Hydrant

Typical Install Depth is 36"




NEW HH
COUNTY ROAD N
COUNTY ROAD O
NICOLAI RD
GARRITY RD
S BRIDGE ST
BEECH ST
SUMMIT LN
E HOWARD/COUNTY RD B
W HOWARD ST
SANDY LN
INDUSTRIAL LN
PINE ST
EXISTING HH
START POINT
SHOP ST
COUNTY ROAD B
BUTTERNUT RD
CANADIAN NATIONAL RAILROAD
CEDAR SPRINGS RD
HILLSIDE RD
SYMCO TOWER END POINT
LITTLE CREEK RD
KNOPP RD

Section 3 UNDERGROUND CONSTRUCTION GUIDELINES

3.01 Duct Placement Guidelines

This overall project entails placement of Single 2" HDPE Duct with 24x36x36 handholes and 36x60x36 Handholes. The Contractor is responsible to provide all duct, handholes, locate posts, locate wire, pull rope, fiber optic cables, termination apparatus, and splicing apparatus as part of their installation responsibilities. There are no District provided materials for this project.

All ducts will be placed on the routes identified in the attached CAD Plans. All ducts must maintain a minimum horizontal clearance zone of 18" when paralleling other underground utilities with the exception of municipal water and sewer (storm and sanitary) mains where parallel runs may be required to maintain additional horizontal clearances per the municipal permitting.

Instances where permitting agencies or others require computer tracked (target Shooting) bore methods will be identified on the CAD Plans.

All underground ducts must be placed a minimum of 36" below finished grade wherever possible. Instances where the duct must be placed at a shallower or drastically deeper depth must be brought to the attention of the Project Manager prior to installation.

The District's Project Manager will be on site to coordinate actual placement. Routes will be marked with the use of paint and flags when necessary. The Contractor must not place duct along the route without first reviewing the individual areas with the Project Manager. This measure is designed to avoid instances where the new duct may encroach the restricted clearance zones of other utilities or extend outside the Right of Way.

All exposed duct ends must be covered with a temporary plug or adequately sealed with duct tape to prevent the ingress of dirt, water, and debris prior to the installation of the cable, locate wire, and mule tape.

Where ducts may be coupled together, the contractor must use an aluminum threaded coupler to make the transition.

3.02 Handhole Placement Guidelines

The Contractor will be required to place new 24"x36"x36" pre-cast handholes - Quazite PG2436BB36 base with PG2436HH21 Extra Heavy Duty ANSI Tier 22 1 piece lid marked "Fiber Optics" or equivalent; and new 36"x60"x36" pre-cast handholes - Quazite PG3048BB36 base with PG3048HH21 Extra Heavy Duty ANSI Tier 22 2-piece lid marked "Fiber Optics" or equivelent at the locations shown on the CAD plans. See the attached CAD drawings for placement location of the handholes.

The handholes must sit parallel with adjacent streets, buildings, or other structures and must be flush with all surrounding surfaces, and if installed on a slope or grade the handhole must follow the contour of the grade as much as possible.

The installed handholes must sit atop a 12" bed of ¾" washed, crushed stone for drainage - pea gravel or other stone smaller than ¾" is not an acceptable base for drainage. All fill around the Handhole must be mechanically compacted in 12" layers to within 8" from the top to prevent settling.

Inside each new handhole the Contractor will be required to install a single 5' long by 1/2" diameter copper clad ground rod. The ground rod must not protrude more than 3" above the surface of the crushed stone bed. After ground rod installation, the Contractor must equip the top with a conductor clamp that will allow the Contractor to tie a #12 AWG UL TYPE USE 2/RHH/RHW-2 Outdoor rated PVC jacketed stranded copper locate wire to the end.

3.03 Locate Station or Post Placement Guidelines

The Contractor will be required to install flush mount locate stations and 31 above grade locate posts adjacent to handholes as identified on the CAD Drawings. The station and posts will be used to access the locate wires for future locating purposes. Flush mount stations will be used in residential and urban areas whereas the above grade locate posts will be used along rural routes.

Between the handhole and locate station or post the Contractor must install a short length of 1-1/4" flexible duct. This will facilitate the installation of the locate wires into the post from the handhole.

At no time will a locate station or post be installed in a location where it impedes or can be damaged by the removal of the handhole lid. Typical placement is on backside of Handhole away from street unless otherwise reviewed with Project Manager.

3.04 Fiber Optic Cable Installation Guidelines

The Contractor can install the fiber optic cable by hand or with the use of pneumatic/hydraulic installation equipment. However the means of installation, the Contractor must take care to not exceed the cable's maximum pulling tension (typically 600lbs). The Contractor must utilize a breakaway/swivel device at all times while installing the fiber optic cables. Multiple swivels must be used; one for the cable, and another set 8" back from the first for the locate wire and mule tape.

At each handhole the Contractor must store a minimum of 150 feet of cable slack (unless otherwise noted on the CAD Plans) neatly coiled and stored upright in the handhole and labeled at each end with a permanent label, identifying the Cable's owner and identifying the specific cable strand count. Suitable labels for this purpose are Panduit #PST-FO.

Following cable installation all occupied ducts must be plugged using a split plug appropriately sized to accommodate the cable diameter - do not use foam, putty, or tape to plug any duct. All spare ducts must be sealed using properly sized duct plugs.

3.05 Locate Wire Installation Guidelines

The Contractor will be required to install a #12 AWG UL TYPE USE 2/RHH/RHW-2 Outdoor rated PVC jacket- stranded copper locate wire along all routes. This locate wire will be installed inside the plowduct with the fiber optic cable.

Where the new locate wire enters the locate posts or flush mount stations, it must be secured to the device's insulating lugs via a crimp-on spade connector. The locate posts and stations are equipped with multiple lugs. The outer lugs are for use with locate wires that run inside the plowduct in either direction from the locate post, while the center lug is used to route a #12 AWG UL TYPE USE 2/RHH/RHW-2 Outdoor rated PVC jacket- stranded copper ground wire through the base of the locate post to the ground rod located inside the adjacent handhole. The Contractor must tie the conductor to the ground rod using the attachment clamp, and to the locate post in the same fashion that is used for the locate wires.

3.06 Mule Tape Installation Guidelines

The Contractor will be required to install a single 1,800 lb mule tape within the plowduct with the locate wire and fiber optic cable.

3.07 Underground installation Documentation

The Contractor will be required to provide bore logs showing rod placement dates and depths as well as redline drawings showing cable placement and cable footage sequentials within the underground duct and interior piping.

Section 4 INTERIOR CONSTRUCTION GUIDELINES

4.01 Above Ground Exterior to Interior Transition

Where the underground plowducts extend to the exterior of a building whose entry point is above grade, the Contractor is required to transition below grade from each plowduct to a Galvanized Rigid Steel pipe that extends up the side of the exterior wall to an elevation shown on the accompanying Interior Drawings. At the below-grade transition point where the rigid pipe meets the plowduct, the Contractor must utilize a watertight fitting that is rated for underground use (Shur-Lock SL 602C 200 or approved equivalent). The Project Manager must approve the final location of building risers.

At the top of the rigid pipe run, the Contractor must core a 2" hole into the building and install a 12"x12"x6" NEMA 3R rated pull box over the hole and aligned so the building core is situated at the top of the pull box. The core into the building must be sleeved with EMT. Interior EMT extending to a termination room can extend through the core to satisfy this sleeve requirement, however instances where Interior EMT is not being placed the Contractor must sleeve the core with EMT and securely fasten the sleeve to the exterior pull box and inside the building. All sleeves/EMT ends must be equipped with collared fittings to avoid cable damage.

Extending out of the bottom of the outdoor pull box, the Contractor must install a 1/2" Rigid Steel pipe down to an elevation of 4 feet from the ground or as noted on the attached interior drawings. This pipe will house the locate wire that runs back to the nearest locate post or housing along the plowduct path. At the bottom of this 1/2" pipe the Contractor must install a steel single gang outdoor outlet box with waterproof cover. A 12" coil of Locate wire must be housed inside the single-gang outlet box.

All exterior pipes and boxes must be securely fastened to the building wall with anchors and fastening hardware suitable for a permanent installation into the materials comprising the wall.

All unique building entry point details are included on the Interior Route Drawings that are part of the CAD Plans.

4.02 Interior Workmanship

Contractor shall take precautions to ensure that dust and debris associated with the project is contained within the work area and not allowed to spread into other areas of the school. Equipment or materials, which cannot be moved, shall be covered by the Contractor to prevent contamination or damage.

All materials used by the Contractor shall be certified asbestos-free by the manufacturer. There will be no exceptions. A letter from the Contractor certifying that no asbestos-containing materials were used shall be provided upon request.

Contractor shall assure that any and all equipment used on this project will be handled and operated in conformance with OSHA safety requirements.

Contractor shall advise the District whenever work is expected to be hazardous to District employees, students or other building occupants.

Contractor shall maintain fire extinguisher within easy access whenever power tools; flammable materials or heat producing devices are being used.

Contractor shall advise the District when volatile materials are to be used near air ventilation intakes or near occupied spaces so that action may be taken to prevent degradation of indoor air quality.

4.03 Interior EMT/Innerduct Installation

Extending from the exterior pull box, the Contractor may be required to install 2" EMT conduit or 1.25" corrugated innerduct (depending on the site) to the building fiber optic termination point along the path shown on the accompanying Interior Piping Drawings. Where this conduit/Innerduct enters either the 2" core of the exterior wall or any interior concrete/block wall cores, the Contractor must seal around the conduit/innerduct with mortar for outdoor seals or ASTM E814 (UL 1479) approved fire stop materials for indoor wall penetrations.

The Contractor must take all necessary precautions to prevent activation of building alarms, such as fire or security. Conduits that enter rooms that are sealed for the sake of Halon release systems must be sealed to ensure that the room's integrity is maintained.

Where the interior conduit passes through any non-concrete/block wall the Contractor must create a hole through the wall only large enough for the conduit to pass through, then seal around the conduit with ASTM E814 (UL 1479) approved fire stop materials.

Prior to cutting or coring into or through any building structure the Contractor must review the core location with the Project Manager.

At each end, and along the interior EMT conduit path approximately every 10 feet, the Contractor must label the EMT with a warning label identifying the contents as a fiber optic cable. Suitable labels are Panduit's #PCV-FOB.

Along the interior EMT conduit or Innerduct path the Contractor may be required to install 12"x12"x6" Type 1 pull boxes fitted with a screw cover for pulling assistance and a 24"x24"x8" Type 1 pull box fitted with a screw cover for cable storage. Pull Box location and size is detailed on each building's Interior Piping Drawing. At every pull box (and building entry box) the Contractor must use screw type fittings to attach the conduit to the box.

Contractor may not use any pull box for a 90-degree turn unless it is specifically spelled out that way on the interior drawings.

The interior 2" conduit must be bonded to a ground point at each building. The Project Manager will determine the ground points. Cable used to Bond the EMT to the Building Ground Electrode will be no smaller than a #6 AWG Stranded copper and must have a green jacket suitable for interior use.

4.04 Interior Cable Installation

At each site the cable will be installed through the new or existing EMT/Innerduct to the termination point. At each 24"x24"x8" storage box along the EMT routes the Contractor must store a 30' expansion loop.

Instances where the interior path uses existing Innerduct, EMT, or other pipe that does not contain an existing pull rope, the contractor may be required to fish the existing pathway and install a pull rope to aid in the installation of the Fiber Optic Cable.

Following the installation of the fiber optic cable through the exterior and interior EMT conduit or innerduct, the Contractor must seal the conduit or innerduct ends (where the EMT enters the outside pull box and where the EMT enters the termination room) with ASTM E814 (UL 1479) approved fire stop materials.

PLACEMENT NOTES (from Appendix 3 Written Specification)

Section 5 CABLE SPLICING TERMINATION AND TESTING GUIDELINES

5.01 Cable Pre-Acceptance Testing

The Contractor crews must perform “pre-acceptance testing” with an Optical Time Domain Reflectometer (OTDR) on each fiber optic cable reel. The pre-acceptance testing will verify the performance of the cable prior to it being installed. Pre-acceptance testing must be performed on every cable strand at 1310nm and 1550nm only from the exposed end of the cable. Test results must be provided to and approved by the Project Manager prior to installation.

5.02 Outdoor Fusion Splicing

The Contractor will be required to Fusion Splice the fiber optic cables at each of the splice points identified on the CAD Plans. The District will provide all splice cases and trays while the Contactor must provide all splice sleeves and consumables.

5.03 Indoor Fiber Termination

All cable terminations will be performed by splicing factory terminated fiber optic cable pigtails to the ends of the fiber optic cables. The District will provide all pigtail assemblies and cable termination and interior splicing panels while the Contactor must provide all splice sleeves and consumables. The Contractor will be required to install all District-provided Termination and Splice equipment as well as route all pre-terminated pigtails between devices.

5.04 Fusion Splicing Equipment

All cable strand splicing will be performed using a fusion splice machine that is capable of splicing within a 0.2dB loss tolerance and equipped with either live monitoring or a Local Injection Detection (LID) testing system, thus ensuring the splice quality while the splice is set up in the machine.

All splices will be protected with appropriate fusion splice sleeves fitted with steel-reinforcing rod(s) (provided by the Contractor).

5.05 Cable Testing

Following the splicing and termination procedures the Contractor will be required to test each strand using an OTDR and Power Meter Light Source (PMLS) at 1310nm and 1550nm. Each terminated strand will be tested between the sites with both devices at both wavelengths. This totals 8 tests per strand. All OTDR tests must be performed using a launch cable that is at least 500 meters in length thus allowing a full view of the initial pigtail connector/splice event loss.

5.06 OTDR Viewing Software

Prior to the OTDR testing the Contractor must provide a copy of the OTDR viewing software that is capable of allowing a user to electronically review the test results. This does not need to be a licensed copy, just one that allows the user to view traces in their native (non-pdf) format.

5.07 Test Documentation

Following the OTDR testing the Contractor must provide the District with one electronic copy of each test performed. Prior to testing, the Contractor will be provided with the strand identification and labeling plan, the electronic copies of the test results must match the labeling scheme provided to the Contractor.

Following the PMLS testing, the Contractor must provide the District with test results showing the total link loss between each site along with the average loss for each strand. The test results must be provided on any Windows® compatible electronic spreadsheet. Each cable strand tested must be labeled per the Owner-provided labelling scheme. This labelling must accompany each test results.

5.08 Optical Loss Budget

The Contractor will be provided with optical link budgets for each installed cable strand. Budget losses are calculated by measuring the total link loss between sites, and then averaging the measurements from both directions using the parameters identified in Table 1included in the written specification document. The test results provided to the Project Manager must confirm that 100% of all installed strands perform within the optical loss budget and within the specific tolerances for individual events identified in Event Loss Table.

Note that even though a link loss test may show a loss that is within the optical budget, any event shown by the OTDR report that exceeds its thresholds listed in the Table will result in a failed test result and must be remedied prior to system acceptance by the District. Instances where individual tolerances cannot be met must be reviewed with the Project Manager prior to completion.

DIGGERS HOTLINE

CALL DIGGERS HOTLINE 3 DAYS BEFORE DIGGING:
AT 811 OR (800) 242-8511
EMERGENCY ONLY: (262) 432-7910

ALL UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE. UTILITY INFORMATION WAS PROVIDED UNDER THE FOLLOWING LOCATE TICKETS: 2017-01-01957, 01961, 01967, 01973, 01978, 01985, 01989, 01993, 01999, 02007, 02019, 02022, 02027, 02035, 02051, 02054, 02058. CONSTRUCTION CONTRACTOR IS RESPONSIBLE FOR THE EXACT LOCATION OF MUNICIPAL AND PRIVATE UTILITIES; COMPLETE REPAIR OF ANY AND ALL DAMAGES & RESTORATION INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR. FACILITY PLACEMENT SUBJECT TO CHANGE UPON FIELD LOCATE COMPLETION.

RIGHTS-OF-WAY ARE DEPICTED BASED ON FIELD OBSERVATIONS AND THE LATEST STATE AND COUNTY RECORDS AVAILABLE.

EXCAVATIONS

Excavations shall not remain open in excess of 24 hours unless specific permission is obtained from the City Engineer.

In all streets, alleys, sidewalks or other public ways, whether improved or unimproved, all excavated material shall be removed and the trench shall be backfilled with flow-able filled slurry mix.

At no time can spoils or other debris be stored or piled in the street gutter.

Excavation stock piling must remain within the public right of way and cannot be placed on or impede any roadways, driveways, sidewalks, or fire hydrants. Any areas that have minimal public right of way available must stock pile the excavated material on a truck bed or trailer. No stock piling of excavated material will be allowed on private property.

Excavations are to remain outside of wetland areas. All excavations must have proper erosion control practices to prevent stock piled materials from entering wetland areas.

Excavations are to remain 75' from the high-water mark of and waterway. Any excavations must have proper erosion control practices to prevent stock piled materials from entering waterways.

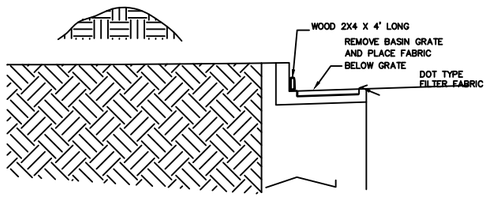
EROSION CONTROL

Any prolonged open excavations or standing debris piles will require erosion control practices such as sandbagging, placing hay bales, or silt fencing around the area.

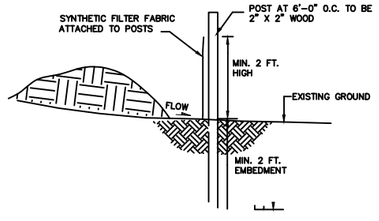
The Contractor must employ good housekeeping practices that will prevent the ingress of any excavated materials into the Municipal storm water system. This includes properly covering storm sewer inlets with DOT Filter Fabric (DOT Type FF, not felt or silt fence material) near areas where excavation and directional drilling operations occur. DOT Type C Inlet protection standards apply (2x4 across back of inlet with DOT Filter Fabric over inlet held in place by inlet cover). Type D Inlet Protection including waddles (fiber filled filter socks) around drains to prevent debris from entering the storm sewer system are required at any low area inlets.

All erosion control measures shall be inspected on a weekly basis and/or after ½” or more of rainfall to ensure the effectiveness of the erosion control measures.

Storm Inlet / Catch Basin Erosion Control:



Silt Fence Erosion Control:



DEWATERING

Dewatering of pits, trenches, hanholes, or manholes must be done with the use of a sentiment bag, a straw bale dewatering basin, or approved equivalent. All dewatering procedures must meet or exceed state standards. All Vacuum Excavation spoils are to be transported and disposed of offsite at an approved dumping station. Dewatering is expected to be negligible given the depth of installation and the nature of the directional boring operations for this project.

FRAC-OUT CONTINGENCY PLAN

Boring activities and bore path are to be continually monitored to observe potential frac-outs. Erosion control materials are to be accessible and onsite should a frac-out occur. Acceptable materials include silt fence, straw bales, and sand bags. As soon as a frac-out is discovered, erosion control must immediately be implemented around the frac-out material (bentonite-water mixture). A vacuum excavation machine is to be accessible on short notice to clean any frac-out material should it occur.

RESTORATION

The Contractor will be allowed to mechanically core through hard surface streets to locate existing utilities provided that the restoration of the core be performed per the specific requirements of the Municipality or Agency having jurisdiction. Core holes must be backfilled with a slurry mixture as specified by the DOT per permitting requirements. The original Concrete or Asphalt core can then be replaced using Plug and Epoxy method.

Potholing is not allowed in ADA compliant or non-compliant pedestrian ramps. Any hard surface excavations within any pedestrian ramp panels will result in the Contractor's replacement of the entire ADA Compliant panel, along with adjacent panels at the Contractor's expense.

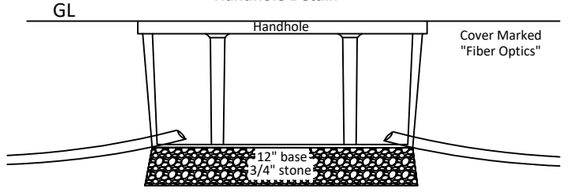
At no time can the Contractor perform any excavation that undermines the adjacent in-tact surfaces, thereby making vertical mechanical compaction impossible and creating future potential for subsurface failure. This scenario will result in the replacement of the effected hard-surface to the permitting authority's specifications.

All disturbed lawns, vegetation, flowers, shrubbery, trees, landscaping, etc. must be replaced or restored to its' previous condition or better. Lawn repair will require a minimum of 4” of black dirt and municipal approved grass blends are to be applied. Grass restoration shall be covered with erosion control mulch. Suitable mulch includes clean weed free straw or marsh hay at a rate of 65lbs (1-1/2 bales) per 1,000 square feet. This should allow about ½ of the soil surface to remain visible. Hydro seed with tackifier is also acceptable. Any restoration on a sloped surface must include the erosion control straw matting (or approved equivalent) and properly held in place with landscape staples.

TRAFFIC CONTROL

The Contractor must provide and follow permitting authority traffic control measures. Please use the Wisconsin MUTCD handbook standards for basic traffic control requirements. The permitting authority holds the rights to require additional traffic control measures to ensure the safety of the community and workers. All traffic control costs will be at the expense of the Contractor.

Handhole Detail:



Section 5 INTERIOR CONSTRUCTION GUIDELINES

5.01 Exterior to Interior Transition

Where the underground plowducts extend to the exterior of a building, the contractor is required to transition below grade from each plowduct to a Galvanized Rigid Steel pipe that extends up the side of the exterior wall. At the below-grade transition point where the rigid pipe meets the plowduct, the Contractor must utilize a watertight fitting that is rated for underground use (ETCO Specialty Products "E-Loc" DEL-237 or equivalent).

At the top of the new rigid pipe runs the contractor must core a 2" hole into the building and install a 12"x12"x6" NEMA 3R rated pull box over the hole and aligned so the building core is situated at the top of the pull box.

All new cores into each building must be sleeved with EMT. Interior EMT extending to a termination room can extend through the core to satisfy this sleeve requirement, however instances where Interior EMT is not being placed the Contractor must sleeve the core with EMT and securely fasten the sleeve to the exterior pull box and inside the building. All sleeves/EMT ends must be equipped with collared fittings to avoid cable damage.

Extending out of the bottom of the outdoor pull box, the Contractor must install a 1" Rigid Steel pipe down to an elevation of 4' above finished grade.

All new exterior pipes and boxes must be securely fastened to the building wall with anchors and fastening hardware suitable for a permanent installation into the materials comprising the wall.

5.02 Interior EMT / Innerduct Installation

Extending from the exterior pull box, the Contractor must install EMT conduit and or Innerduct (type, size, and quantity shown on Interior Drawings) to the building fiber optic termination point along the path shown on the accompanying Interior Drawings. The Contractor must seal around the conduit pack at all wall penetrations.

The Contractor must take all necessary precautions to prevent activation of building alarms, such as fire or security. Conduits the enter rooms that are sealed for the sake of Halon release systems must be sealed to ensure that the room's integrity is maintained.

Where the interior conduit passes through any non-concrete/block wall the Contractor must create a hole through the wall only large enough for the conduit to pass through, then seal around the conduit with ASTM E814 (UL 1479) approved fire stop materials.

Prior to cutting or coring into or through any building structure that could be deemed as "building support structure" the Contractor must obtain permission from the Project Manager.

At each end, and along the interior conduit path approximately every 10 feet, the Contractor must label the EMT with a warning label identifying the contents as a fiber optic cable. Suitable labels are Panduit's #PCV-FOB.

Along the interior the contractor may be required to install 12"x12"x6" Type 1 pull boxes fitted with a screw cover for pulling assistance and a 24"x24"x8" Type 1 pull box fitted with a screw cover for cable storage. Pull Box location and size is detailed on each building's Interior Piping Drawing. At every pull box (and building entry box) the contractor must use screw type fittings to attach the conduit/innerduct to the box.

Contractor may not use any interior pull box as a replacement for a 90-degree turn.

The interior conduits will to be bonded to a ground point at each building. The Project Manager will determine the ground points. Cable used to Bond the EMT to the Building Ground Electrode will be no smaller than a #6 AWG Stranded copper and must have a green jacket suitable for interior use.

The Contractor must have all necessary tools onsite to allow for the installation of the Interior pipe outlined in this document. This includes a Hydraulic Pipe Bender to accommodate the interior EMT sizes specified allowing offsets that will be required for the installation.

5.03 Interior Cable Installation

At each site the cable will be installed within existing cable tray to an existing data rack. At some point within the cable tray, NEMA box, or cabinet as defined on the Interior plans in each building the Contractor must store a 30' expansion loop.

Following the installation of the fiber optic cable through the exterior and interior EMT conduit, the Contractor must seal the conduit ends (where the EMT enters the outside pull box and where the EMT enters the termination room) with ASTM E814 (UL 1479) approved fire stop materials.

All cables will be protected from the point they exist the EMT to the point they enter the rack or wall mount termination unit using innerduct sized appropriately for the cable.

Section 6 CABLE SPLICING TERMINATION AND TESTING GUIDELINES

6.01 Cable Pre-Acceptance Testing

Prior to release to the Contractor, the Owner will require the Contractor crews to perform "pre-acceptance testing" with an Optical Time Domain Reflectometer (OTDR) on each fiber optic cable. The pre-acceptance testing will verify the performance of the cable prior to it being released into the Contractor's possession. Pre-acceptance testing must be performed on every cable strand at 1310nm and 1550nm only from the exposed end of the cable. Test results must be provided to and approved by the Project Manager prior to release of the cable to the Contractor for installation.

6.02 Outdoor Fusion Splicing

The Contractor will be required to Fusion Splice the fiber optic cables at each of the splice points identified on the CAD Plans the Owner will provide all splice cases and trays while the Contactor must provide all splice sleeves and consumables.

6.03 Indoor Fiber Termination

All cable terminations will be performed by splicing factory terminated fiber optic cable pigtails to the ends of the outdoor fiber optic cables. The Owner will provide all pigtail assemblies and cable termination and interior splicing panels while the Contactor must provide all splice sleeves and consumables. The Contractor will be required to install all Owner-provided Termination and Splice equipment as well as route all pre-terminated pigtails between devices.

6.04 Fusion Splicing Equipment

All cable strand splicing will be performed using a fusion splice machine that is capable of splicing within a 0.1dB loss tolerance and equipped with either live monitoring or a Local Injection Detection (LID) testing system, thus ensuring the splice quality while the splice is set up in the machine.

All splices will be protected with appropriate fusion splice sleeves fitted with steel-reinforcing rod(s) (provided by the Contractor).

6.05 Cable Testing

Following the splicing and termination procedures the Contractor will be required to test each strand using an OTDR and Power Meter Light Source (PMLS) at 1310nm and 1550nm. Each terminated strand will be tested between the sites along the ring with both devices at both wavelengths. This totals 8 tests per strand.

All OTDR tests must be performed using a launch cable that is at least 150 meters in length. OTDR event thresholds must be set to show all events greater than 0.01db to will allow the inspector to review all splices or anomalies that register greater than 0.01 along the trace.

6.06 OTDR Viewing Software

Prior to the OTDR testing the Contractor must provide a copy of the OTDR viewing software that is capable of allowing a user to electronically review the test results.

6.07 Test Documentation

Following the OTDR testing the Contractor must provide the Owner with one electronic copy of each test performed. Prior to testing, the Contractor will be provided with the strand identification and labeling plan, the electronic copies of the test results must match the labeling scheme provided to the Contractor.

Following the PMLS testing, the Contractor must provide the Owner with test results showing the total link loss between each site along with the average loss for each strand. The test results must be provided on any Windows® compatible electronic spreadsheet.

All tests must be saved with origination point, end point, and strand number identified within the trace name. Abbreviations for sites are recommended.

6.08 Optical Loss Budget

The Contractor will be provided with optical link budgets for each installed cable strand. Budget losses are calculated using the total link loss between sites, and then averaging the result of both directions using the parameters identified in Table 1 below. The test results provided to the Project Manager must confirm that 100% of all installed strands perform within the optical loss budget and within the specific tolerances for individual events identified in Table 1 below.

Note that even though a link loss test may show a loss that is within the optical budget, any event shown by the OTDR report that exceeds its thresholds listed in the Bidding Documents will result in a failed test result and must be remedied prior to system acceptance by the Owner. Instances where individual tolerances cannot be met must be reviewed with the Project Manager prior to completion.

EXCAVATIONS

Excavations shall not remain open in excess of 24 hours unless specific permission is obtained from the City Engineer.

In all streets, alleys, sidewalks or other public ways, whether improved or unimproved, all excavated material shall be removed and the trench shall be backfilled with flow-able filled slurry mix.

At no time can spoils or other debris be stored or piled in the street gutter.

Excavation stock piling must remain within the public right of way and cannot be placed on or impede any roadways, driveways, sidewalks, or fire hydrants. Any areas that have minimal public right of way available must stock pile the excavated material on a truck bed or trailer. No stock piling of excavated material will be allowed on private property.

Excavations are to remain outside of wetland areas. All excavations must have proper erosion control practices to prevent stock piled materials from entering wetland areas.

Excavations are to remain 75' from the high-water mark of and waterway. Any excavations must have proper erosion control practices to prevent stock piled materials from entering waterways.

EROSION CONTROL PLAN

Any prolonged open excavations or standing debris piles will require erosion control practices such as sandbagging, placing hay bales, or silt fencing around the area.

The Contractor must employ the following good housekeeping practices that will prevent the ingress of any excavated materials into the Municipal storm water system:

1) Cover Storm Sewer Inlet with DOT Filter Fabric (DOT Type FF, not felt or silt fence material) near areas where excavation and directional drilling operations occur. DOT Type C Inlet protection standards apply (2x4 across back of inlet with DOT Filter Fabric over inlet held in place by inlet cover). Type D Inlet Protection including waddles (fiber filled filter socks) around drains to prevent debris from entering the storm sewer system are required at any low area inlets.
2) Place Silt Fence Barrier around excavation per below typical specification Diagram. Silt Fence to be inspected prior to excavation.
3) Place Sand Bag Barrier around Spoils to prevent runoff ingress into Storm Water Management System.
4) Protect graded restoration area using fibrous matting to prevent erosion into Storm Water Management System
5) Place temporary soil stabilization materials to prevent erosion into Storm Water Management System.

All erosion control measures shall be inspected on a weekly basis and/or after ½" or more of rainfall to ensure the effectiveness of the erosion control measures.

DEWATERING

Dewatering of pits, trenches, hanholes, or manholes must be done with the use of a sediment bag, a straw bale dewatering basin, or approved equivalent. All dewatering procedures must meet or exceed state standards. All Vacuum Excavation spoils are to be transported and disposed of offsite at an approved dumping station. Dewatering is expected to be negligible given the depth of installation and the nature of the directional boring operations for this project.

FRAC-OUT CONTINGENCY PLAN

Boring activities and bore path are to be continually monitored to observe potential frac-outs. Erosion control materials are to be accessible and onsite should a frac-out occur. Acceptable materials include silt fence, straw bales, and sand bags. As soon as a frac-out is discovered, erosion control must immediately be implemented around the frac-out material (bentonite-water mixture). A vacuum excavation machine is to be accessible on short notice to clean any frac-out material should it occur.

RESTORATION

The Contractor may be allowed to mechanically core through hard surface streets to locate existing utilities provided that the restoration of the core be performed per the specific requirements of the Municipality or Agency having jurisdiction. Core holes must be backfilled with a slurry mixture as specified by the DOT per permitting requirements. The original Concrete or Asphalt core can then be replaced using Plug and Epoxy method.

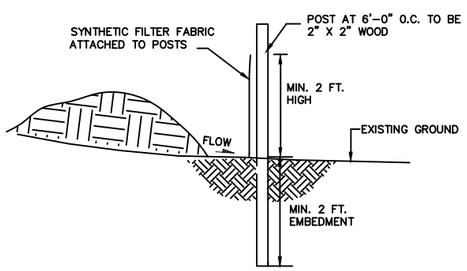
Potholing is not allowed in ADA compliant or non-compliant pedestrian ramps. Any hard surface excavations within any pedestrian ramp panels will result in the Contractor's replacement of the entire ADA Compliant panel, along with adjacent panels at the Contractor's expense.

At no time can the Contractor perform any excavation that undermines the adjacent in-tact surfaces, thereby making vertical mechanical compaction impossible and creating future potential for subsurface failure. This scenario will result in the replacement of the effected hard-surface to the permitting authority's specifications.

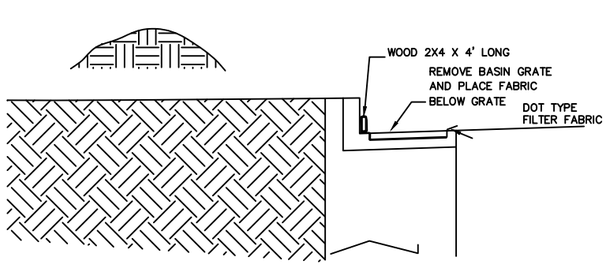
All disturbed lawns, vegetation, flowers, shrubbery, trees, landscaping, etc. must be replaced or restored to its previous condition or better. Lawn repair will require a minimum of 4" of black dirt and municipal approved grass blends are to be applied.

All areas of restoration using Black Dirt and Seed must be protected with biodegradable net-free fibrous matting. Placement of loose straw or other materials that can be easily blown away or otherwise eroded/removed from the restored area will not be permitted. Fibrous matting materials will must be included in the Contractor Cut Sheets and approved by the Owner for use prior to placement.

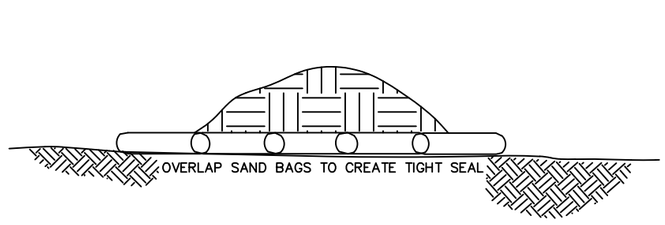
Silt Fence Erosion Control:



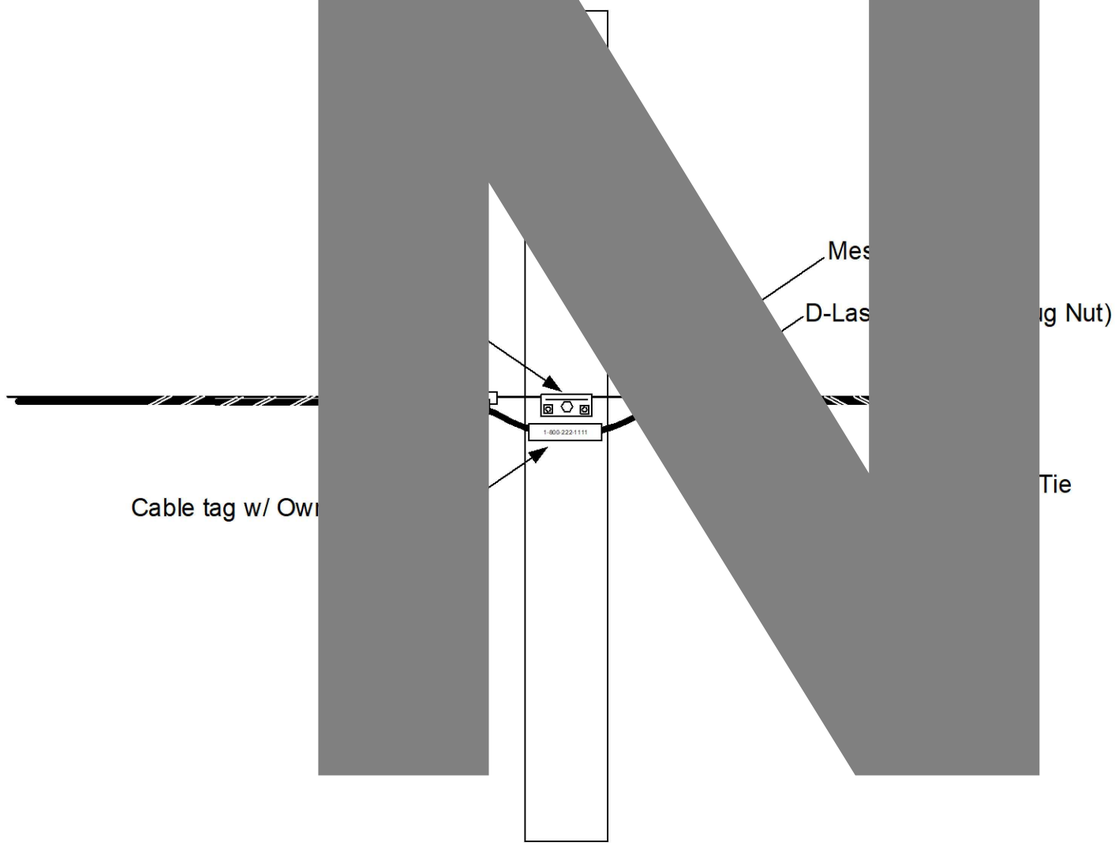
Storm Inlet / Catch Basin Erosion Control:



Sand Bag Barrier Erosion Control:



Pole Attachment

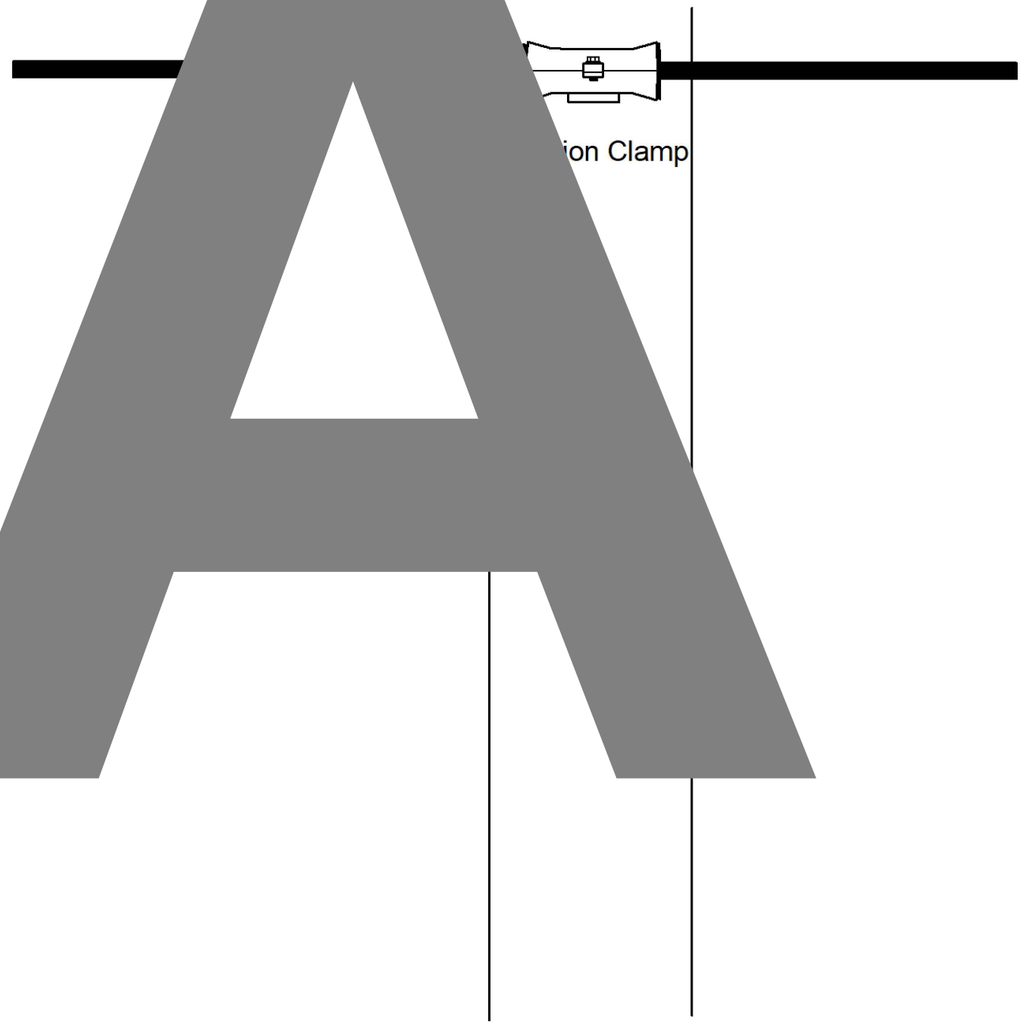


ADSS Pole Attachment

NOTES:

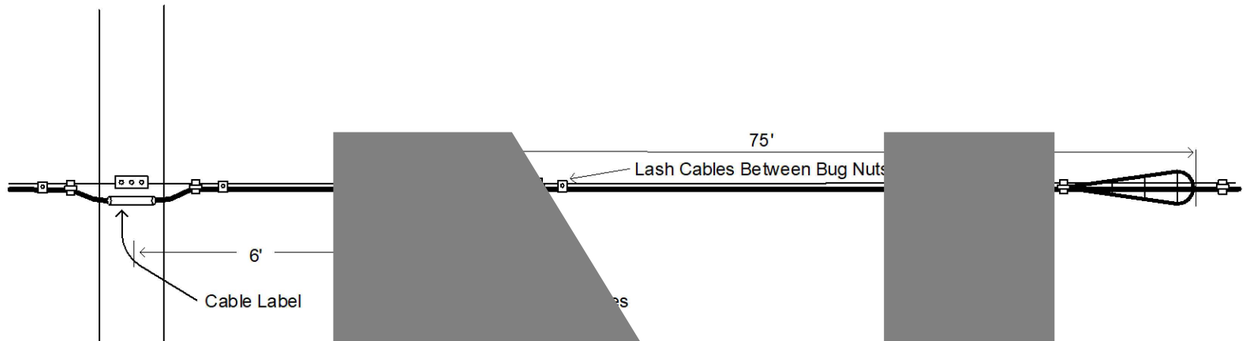
1.) Mount Trunion Clamp at elevation shown on the acc

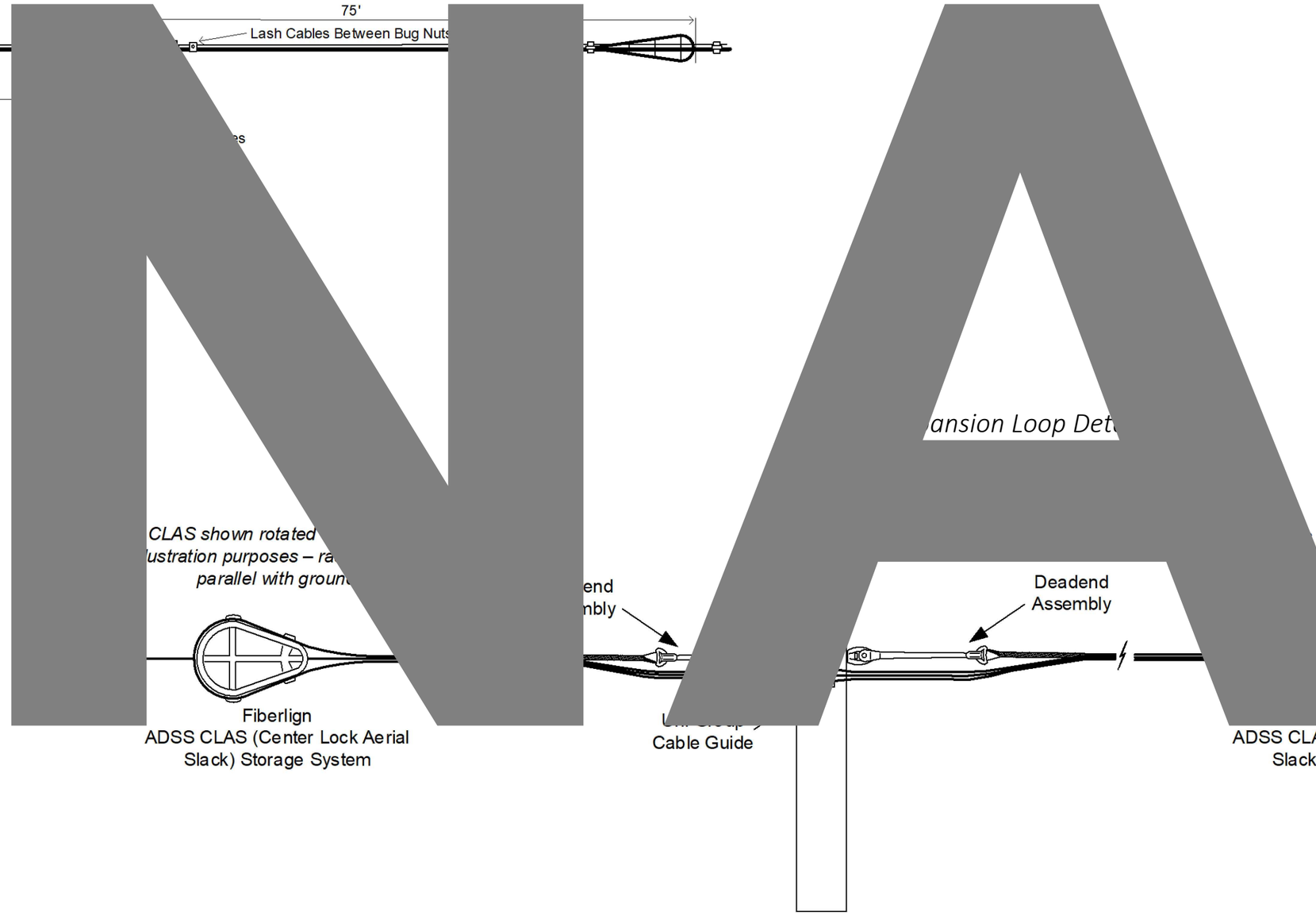
2.) Tru st be fitted with properly sized bushing fo d.



N/A

Strands and Lash Expansion Loop Detail

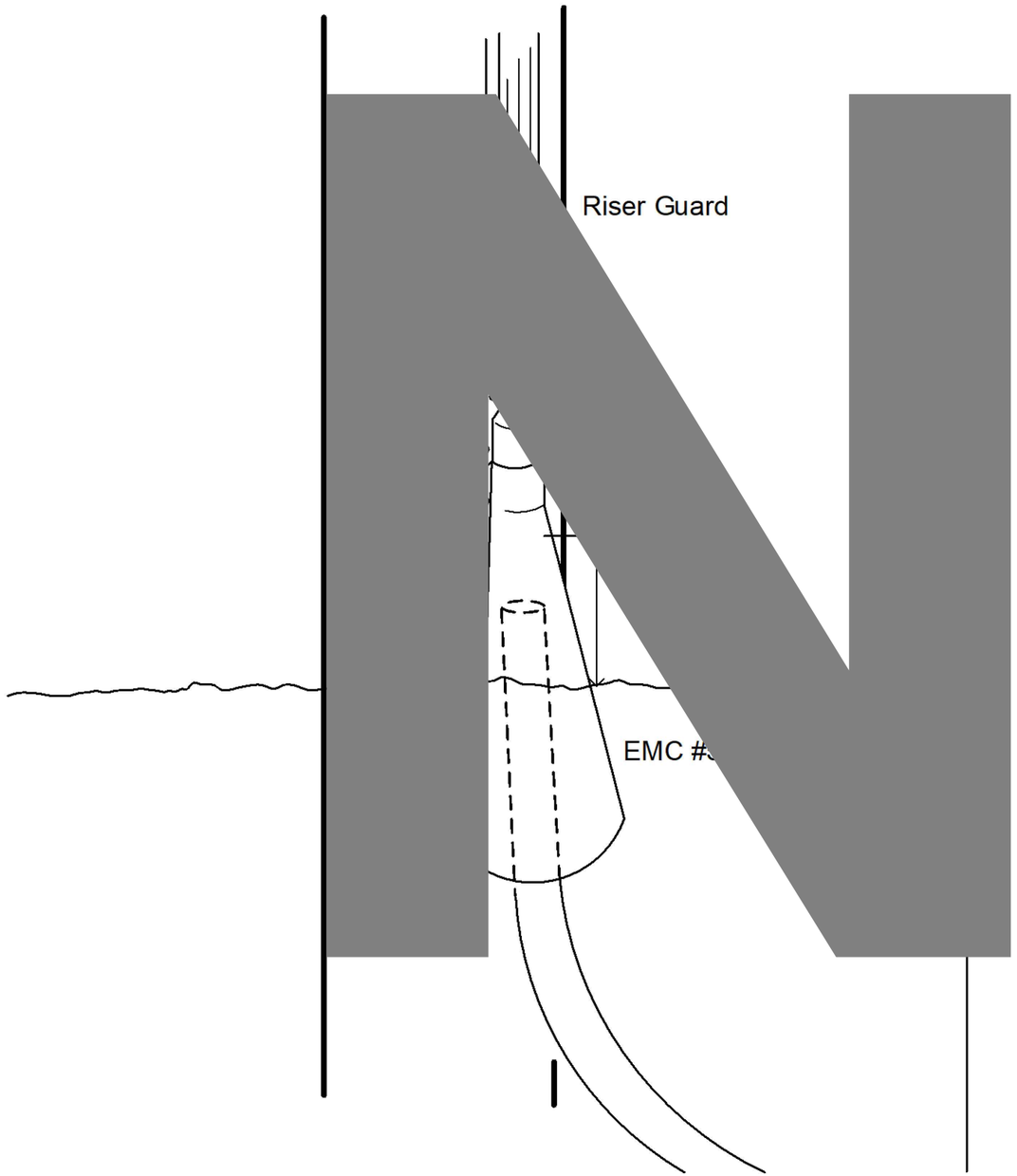




N/A

ansion Loop Det

Riser Guard Detail

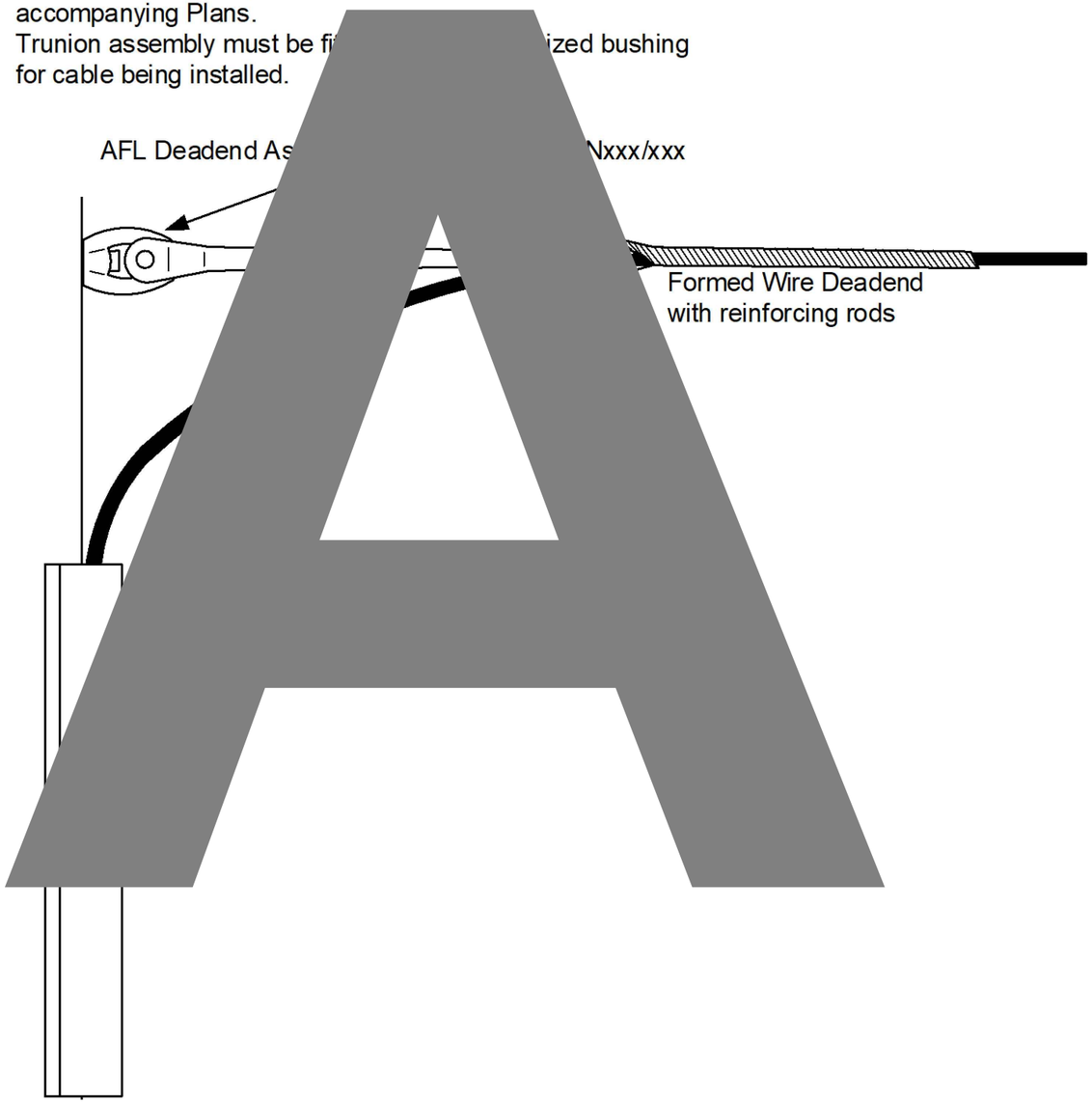


ADSS Deadend Detail

NOTES:

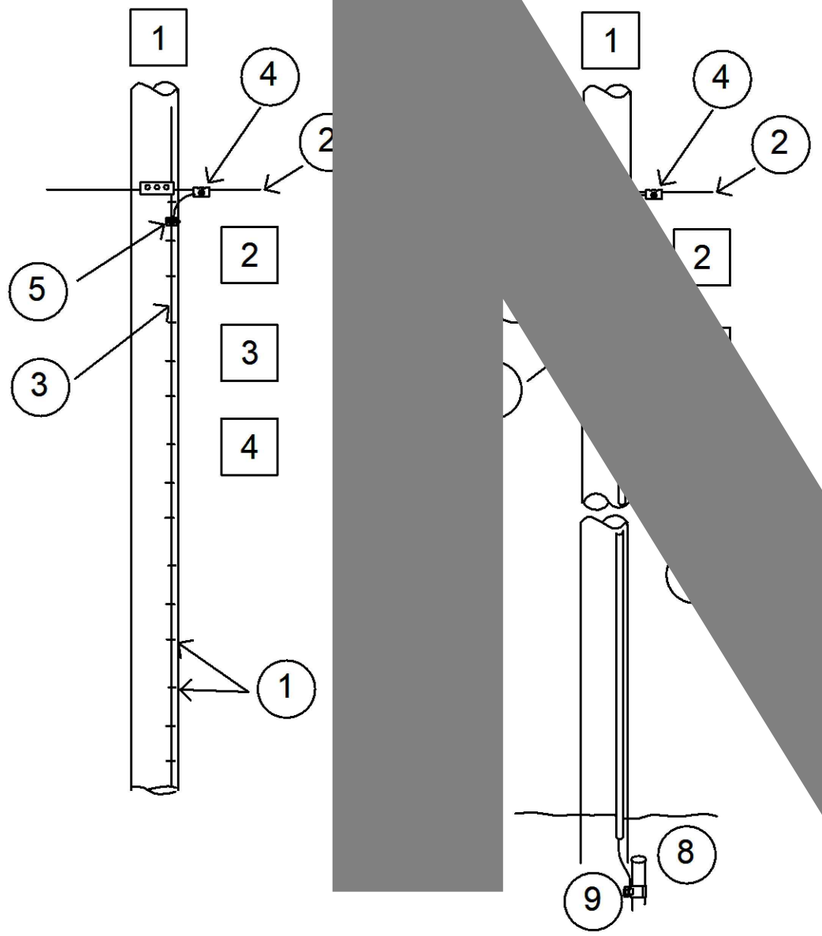
1.) Mount Trunion Clamp at elevation shown on the accompanying Plans.

2.) Trunion assembly must be fi ized bushing for cable being installed.



Bond to Existing Vertical Ground

Install New Vertical Ground



NOTES:

1.) Communications shall bond wherever the power has verticle ground. If the ground is under the power company U-guard, contact the power company to [illegible] the ground connection. Using the [illegible]iate parallel groove clamp, [illegible]5), the power company will [illegible]6 grd to communication 1/4

[illegible]hall be no. 6 bare copper. [illegible]ire is more than 12" long, st[illegible]

If [illegible]overing the ground, remove only [illegible]ing to install the bond conn[illegible] moulding shall be cut with a[illegible] sharp knife and not broker[illegible]

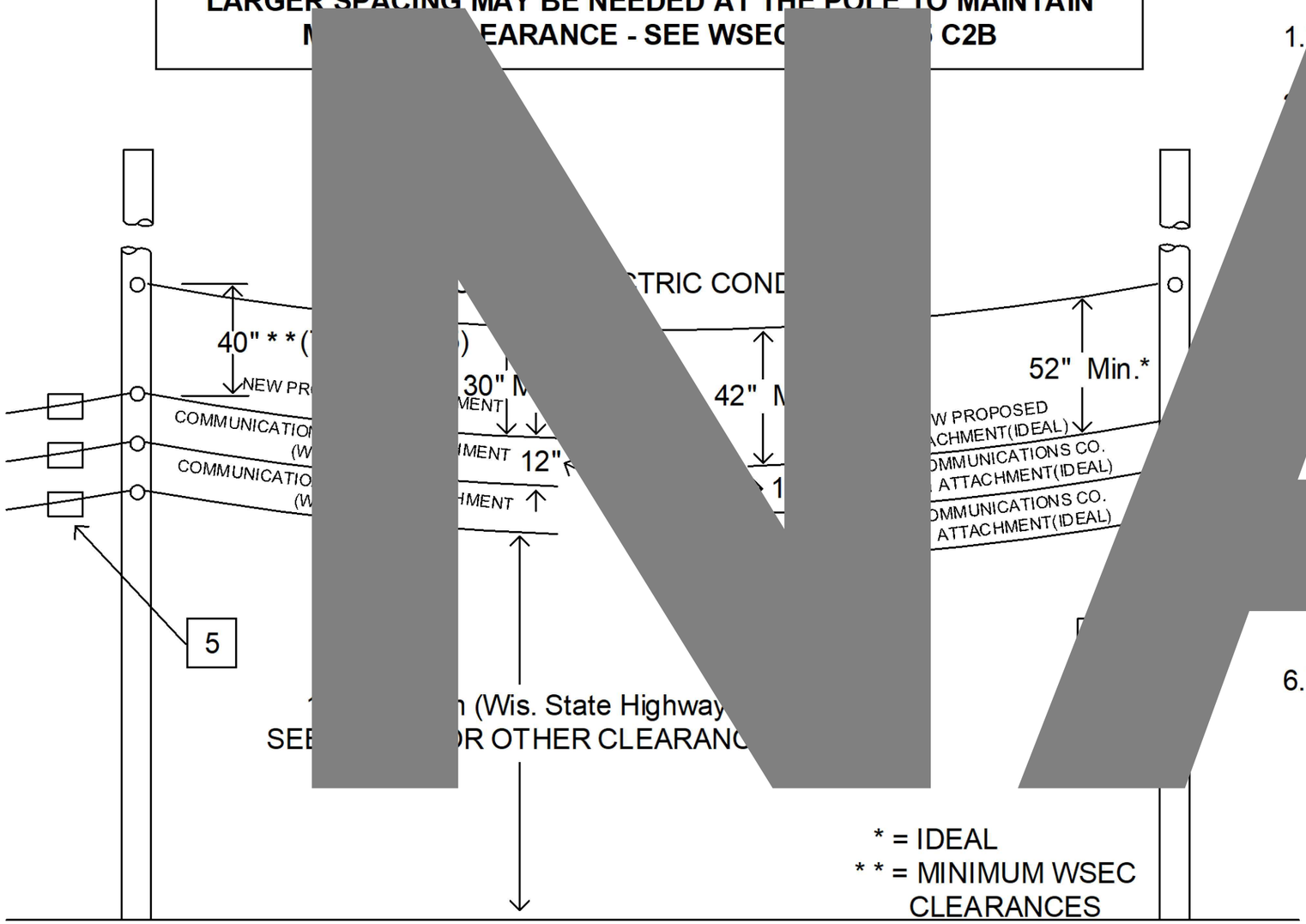
5.) When c[illegible]n circuits are [illegible]destal shall be 6 ft. [illegible]f it is impossible to [illegible]le, it shall be [illegible]tight to the pole and outside [illegible]g space.

6.) When commu[illegible] underground and power is o[illegible]equired that communications [illegible]terconnected to the power sup[illegible]e connection shall be made below grade

Note * Where the minimum of 8 connections to ground per mile can not be met by using existing verticals, new verticals with ground rod and connectors must be installed tot meet this minimum requirement

NO ADJUSTMENT TO ELECTRIC FACILITIES ALLOWED OTHER THAN BY LOCAL ELECTRIC COMPANY LINE PERSONNEL OR IT'S APPROVED CONTRACTOR.

LARGER SPACING MAY BE NEEDED AT THE POLE TO MAINTAIN M EARANCE - SEE WSEC C2B

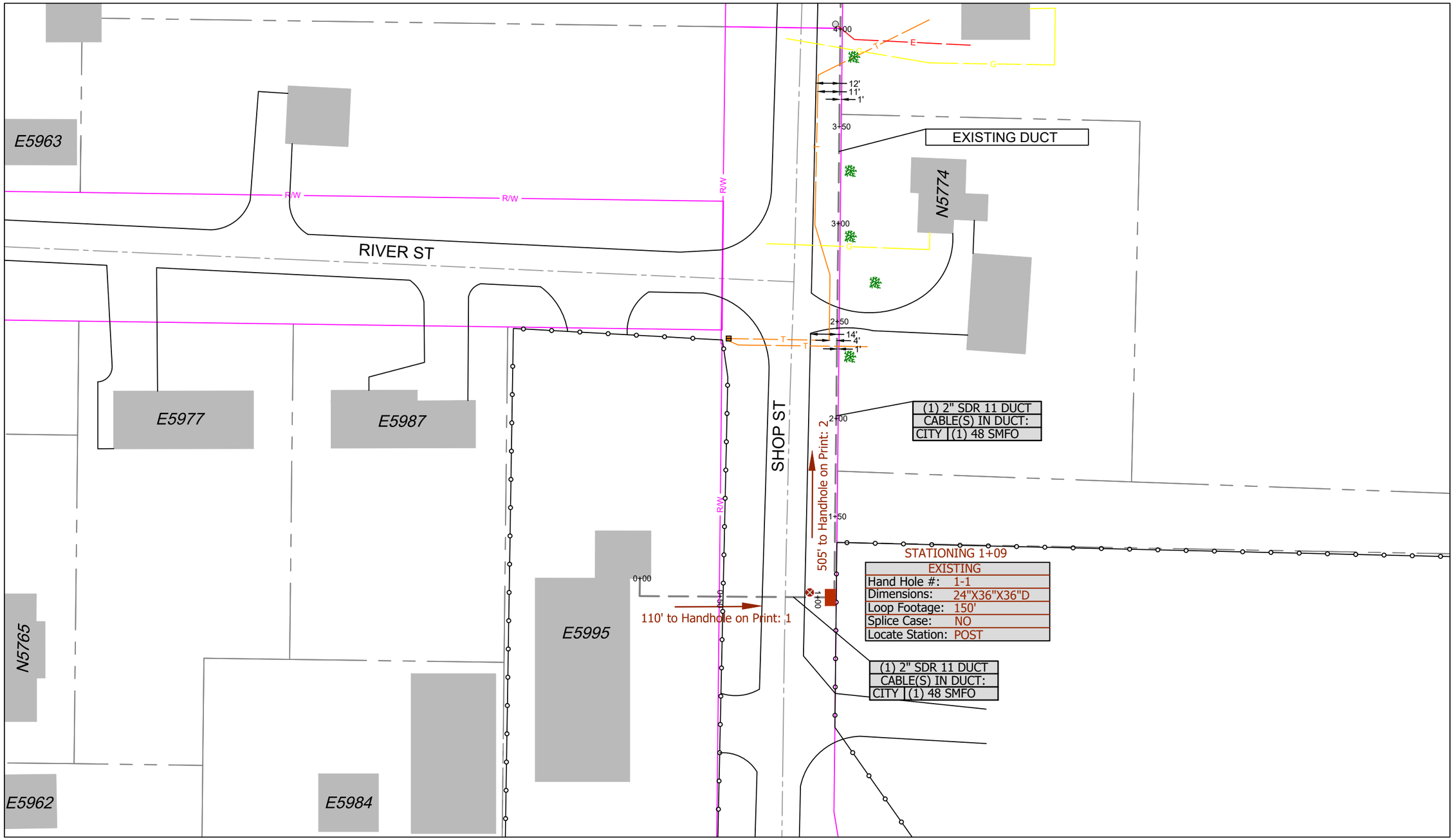


NOTES:

1.) r is to make all attachments at shown on attached CAD drawings isconsin State Electrical Code, test issue (NESC is part of WSEC).
nication company is allocated one n pole. Initial ideal attachment ottom of that one foot of space.
Ove not be done without the pole owne Overlashing can result in exces excessive transverse loading sponsibility of the party doing the over rk with the pole owner to determin ra sags meet codes and requir gths.
achment #1, as shown, mum road clearances e or WISDOT requirements ding. PLUS 6 inches.

6.) Each non supply labeled by owner; clearly showing hour emergency telephone number.

See Sheet 02



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P: 920.393.3492 I 877.870.6968

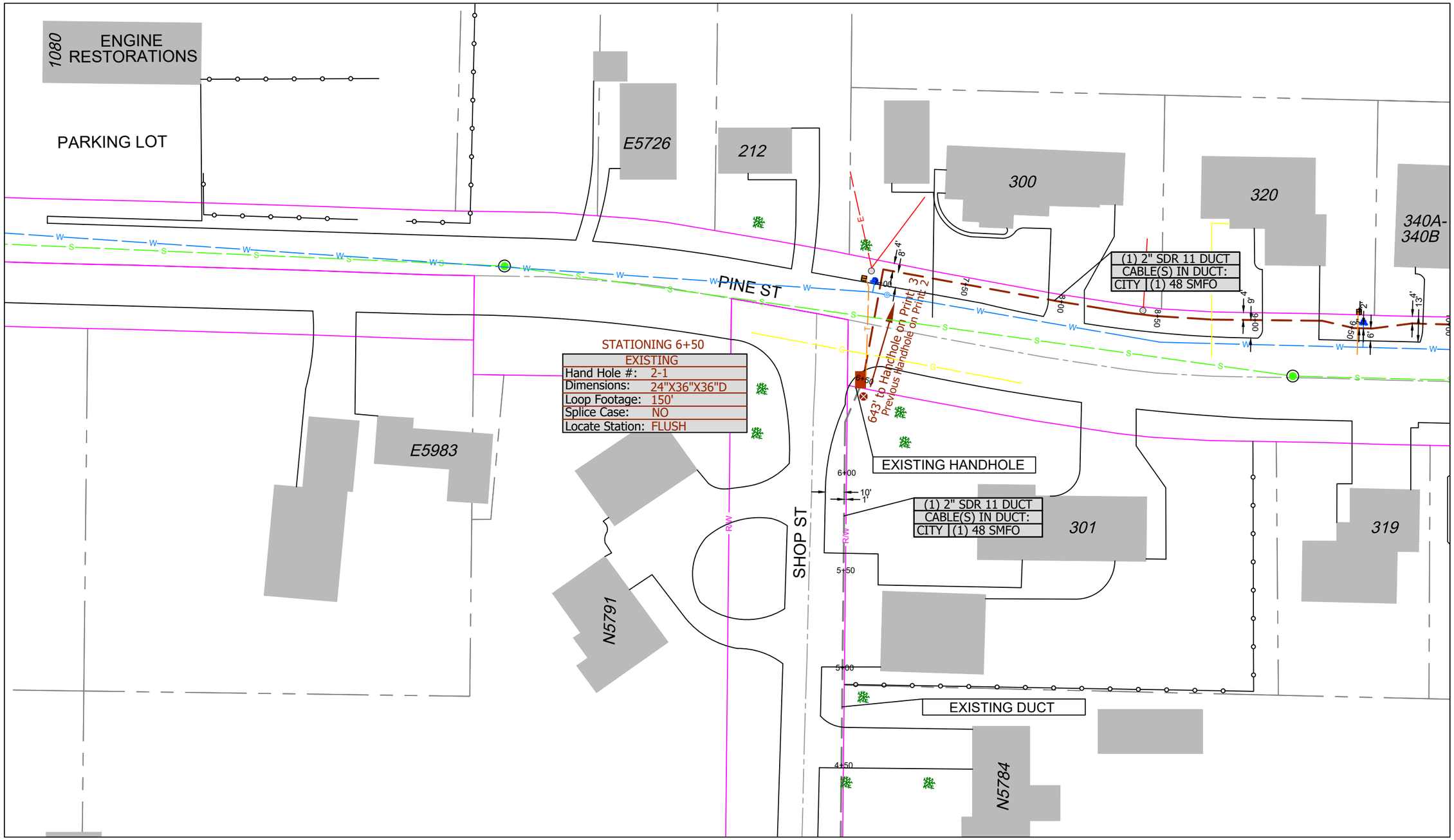
Scale: 1" = 50' ANSI B/Tabloid (0, 50', 100', N)

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 01

Permits required on this sheet:



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0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 02

Permits required on this sheet:

See Sheet 04

See Sheet 02

175

340A-
340B

360A-
360B

380A-
380B

339

359

379

401

SANDY LN

PINE ST

15+50

15+00

14+50

14+00

13+50

13+00

12+50

12+00

11+50

11+00

10+50

RW

S

W

G

9'
4'
6'
8'
5'
8'
4'
8'

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

1490' to Handhole on Print: 6
Previous Handhole on Print: 2

STATIONING 12+96

NEW INSTALL	
Hand Hole #:	3-1
Dimensions:	24"X36"X36"
Loop Footage:	150'
Splice Case:	NO
Locate Station:	FLUSH

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0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

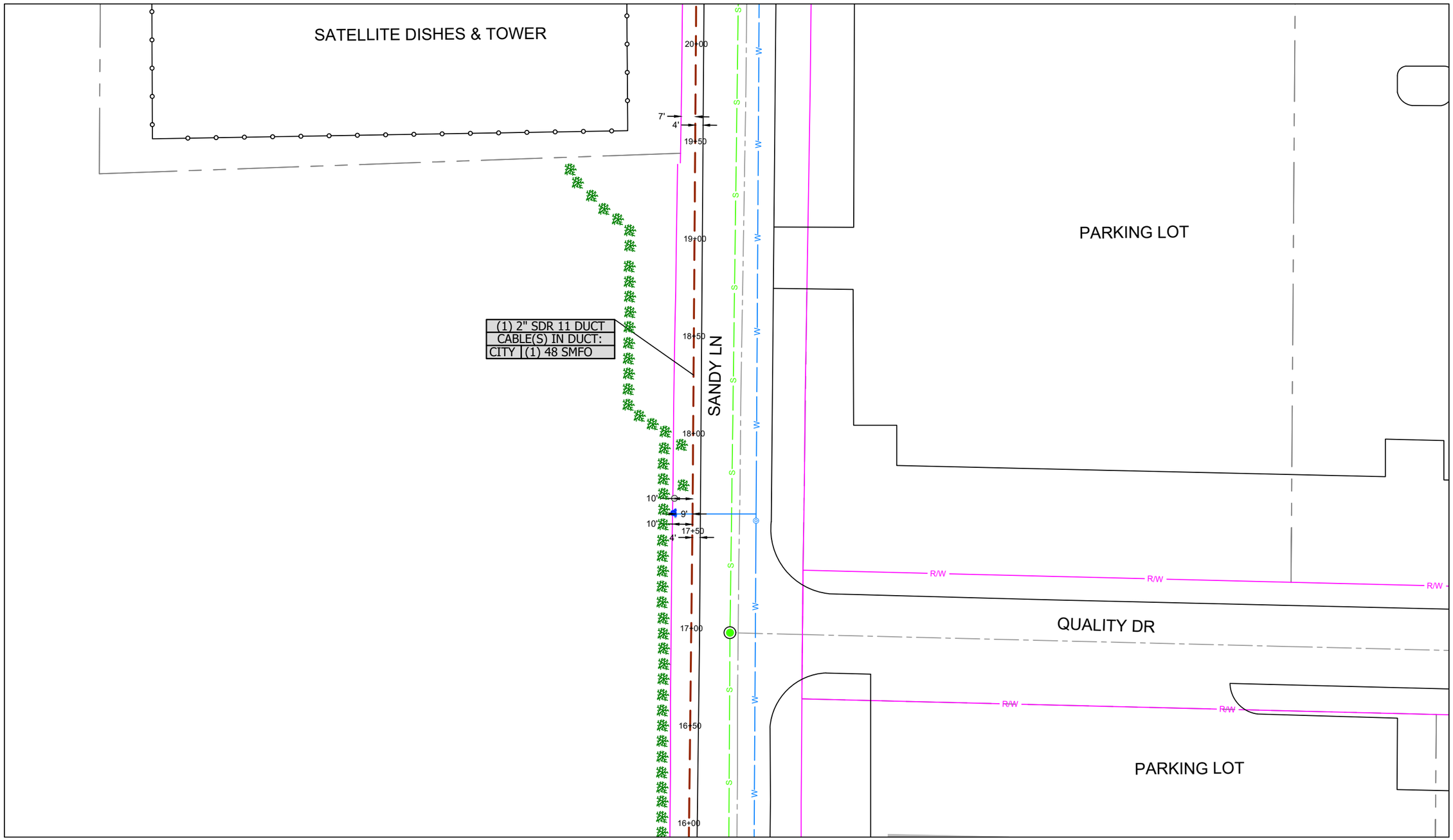
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
03

Permits required on this sheet:

See Sheet 05



See Sheet 03

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0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

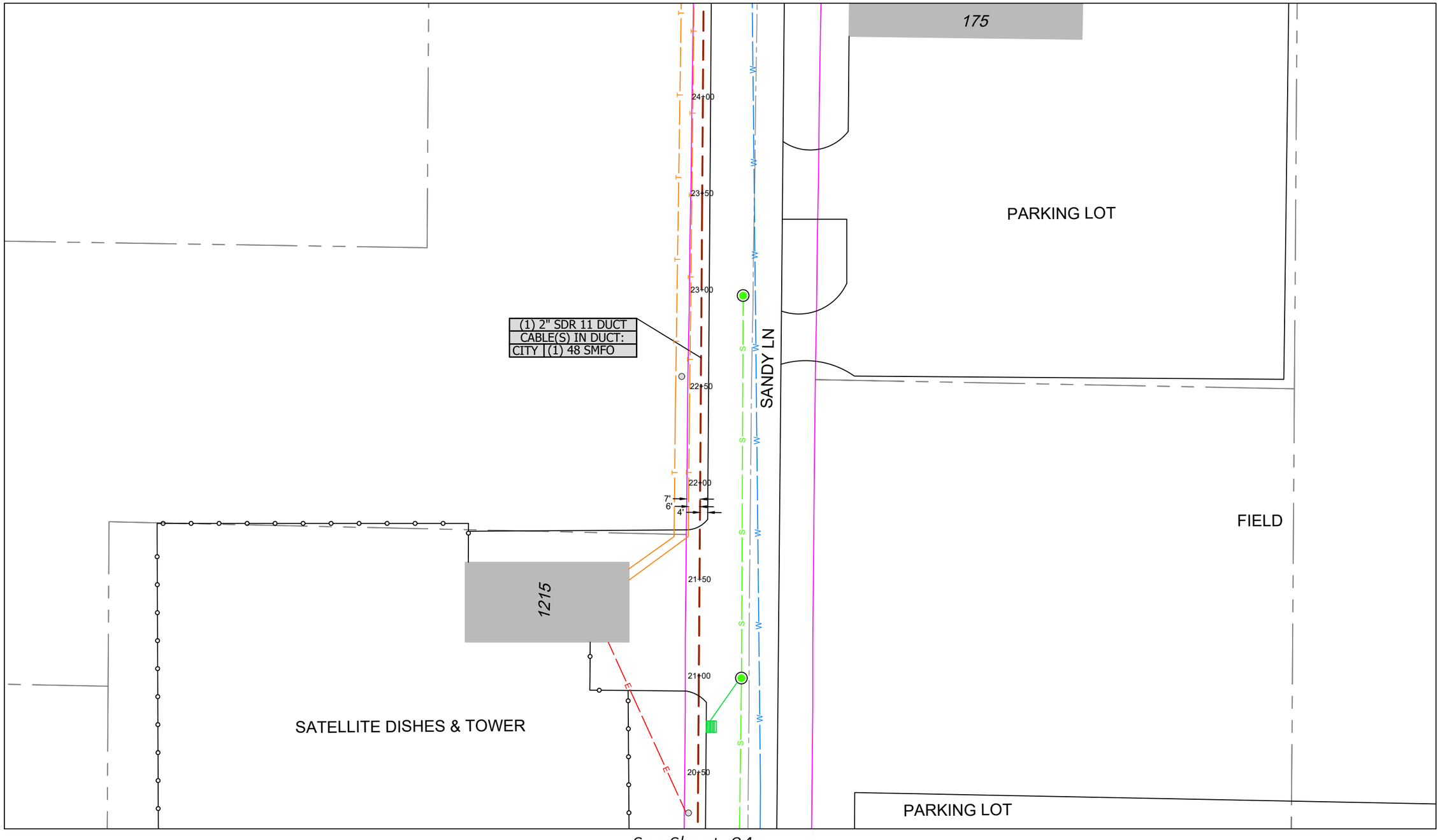
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 04

Permits required on this sheet:

See Sheet 06



See Sheet 04

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P: 920.393.3492 I 877.870.6968

0 50' 100' N

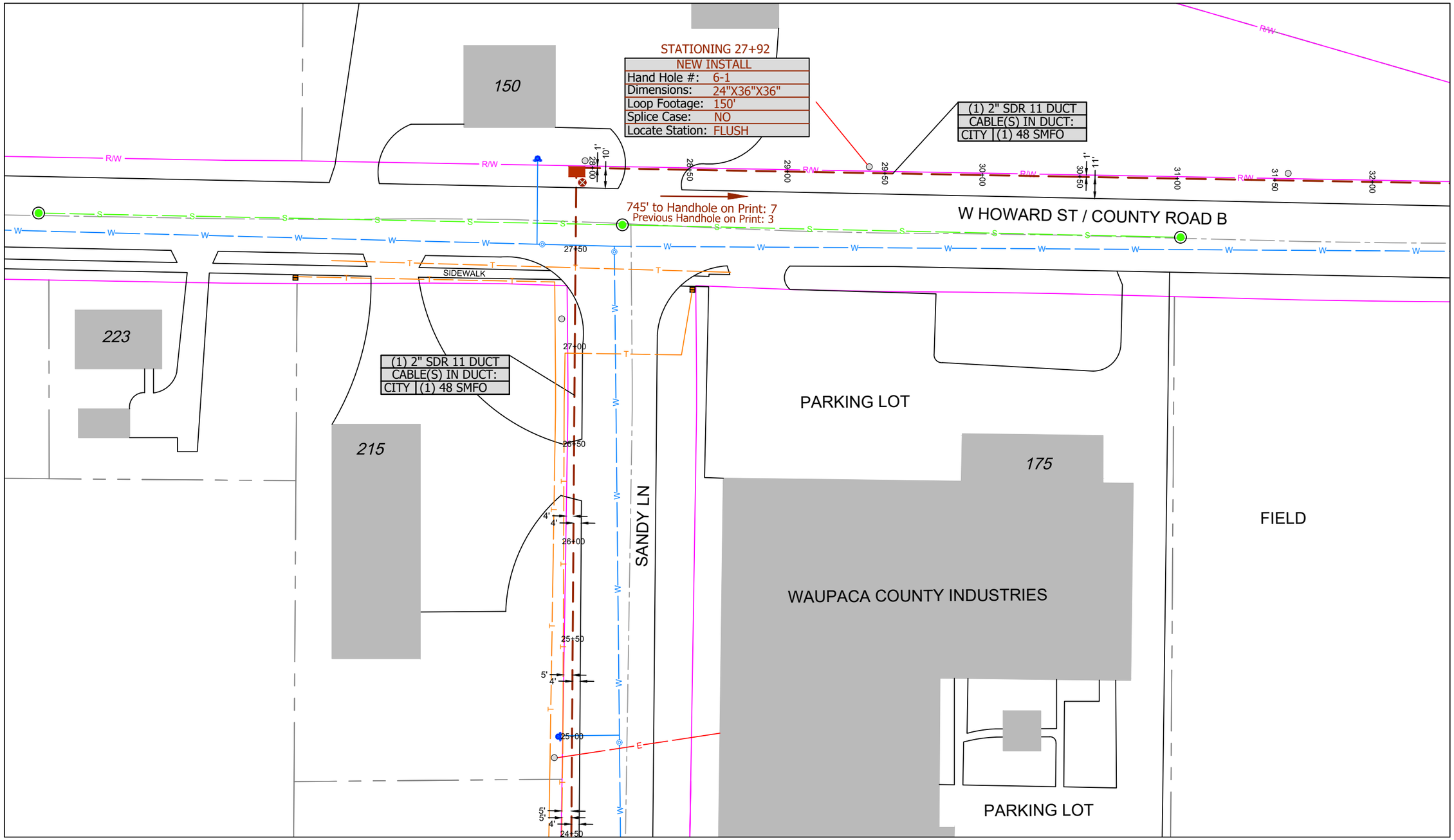
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 05

Permits required on this sheet:



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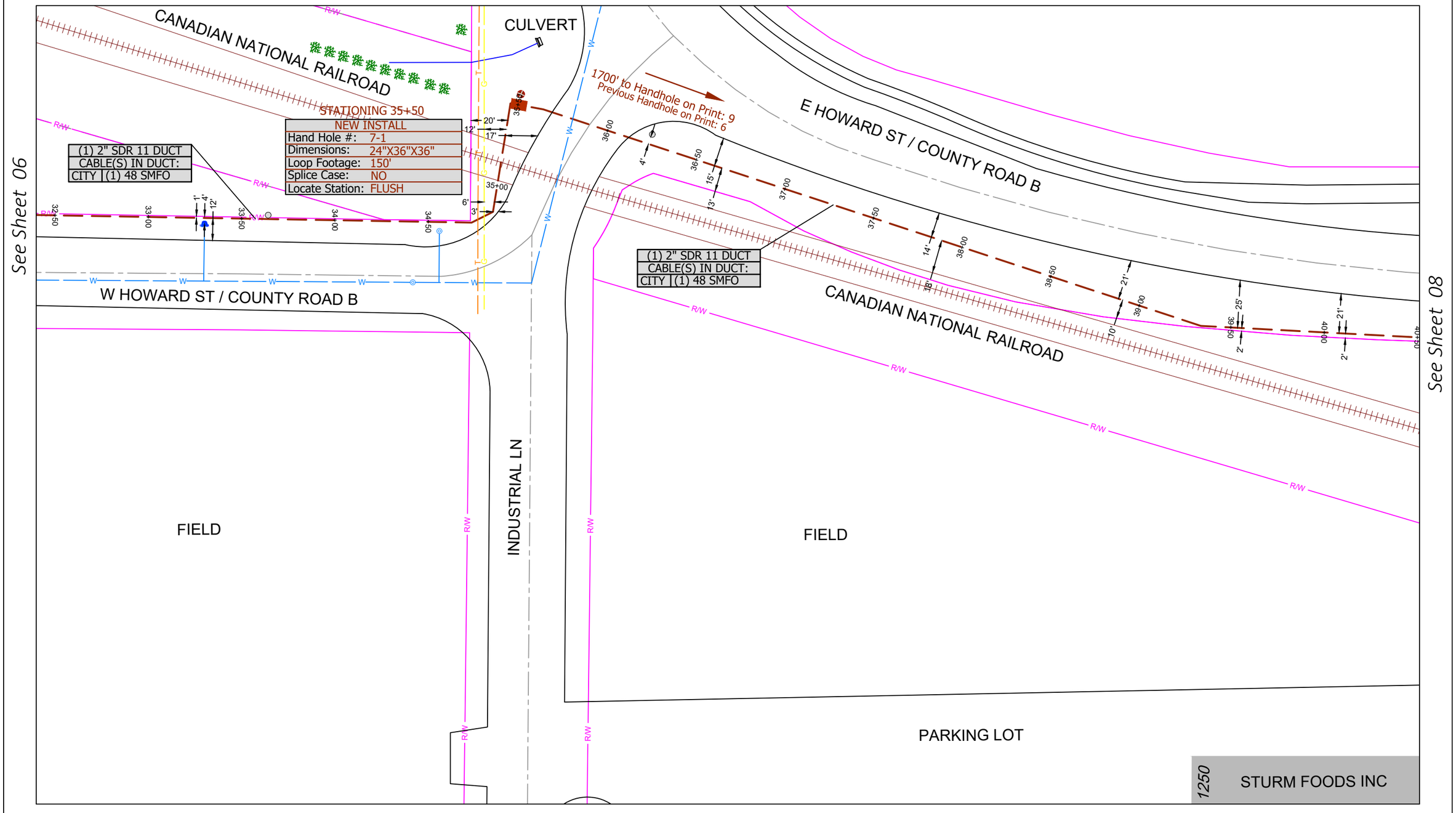
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

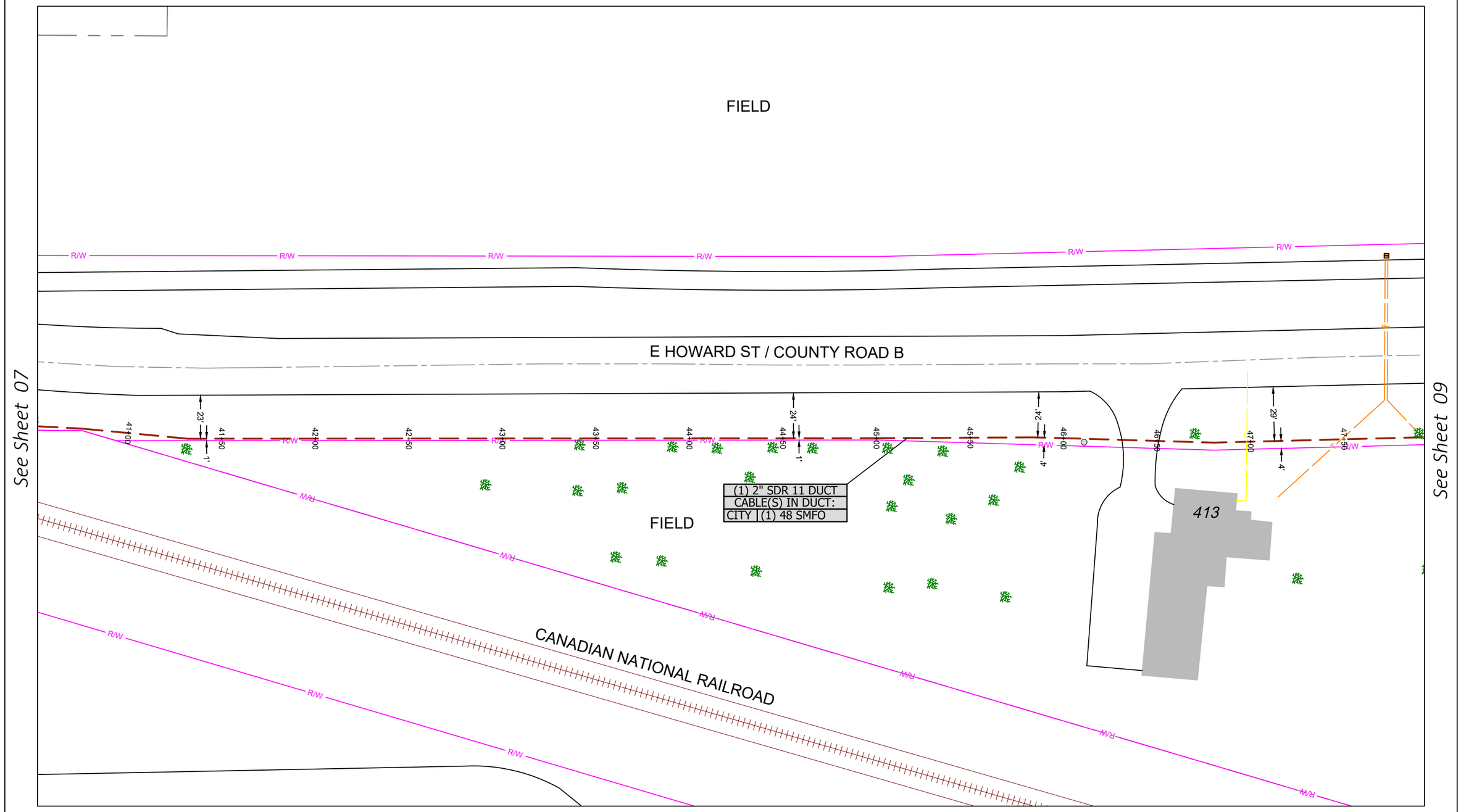
Sheet Group: 1:50 Scaled Plans

Sheet ID: 06

Permits required on this sheet:



Permits required on this sheet:



Multimedia Communications & Engineering, Inc. PO Box 11064 Green Bay, WI 54307 P: 920.393.3492 I 877.870.6968	0 50' 100' N *Scale: 1" = 50' ANSI B/Tabloid*	SYMCO TOWER CONNECT 06/05/2018	Sheet Group: 1:50 Scaled Plans	Sheet ID: 08

Permits required on this sheet:

See Sheet 08

FIELD

R/W R/W R/W R/W

E HOWARD ST / COUNTY ROAD B

34' 27' 24'

48+00 48+50 49+00 49+50 50+00 50+50 51+00 51+50 52+00 52+50 53+00 53+50 54+00 54+50 55+00

785' to Handhole on Print: 10
Previous Handhole on Print: 7

STATIONING 52+66

NEW INSTALL	
Hand Hole #:	9-1
Dimensions:	24"X36"X36"
Loop Footage:	150'
Splice Case:	NO
Locate Station:	FLUSH

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

E5644

FIELD

See Sheet 10

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0 50' 100' N

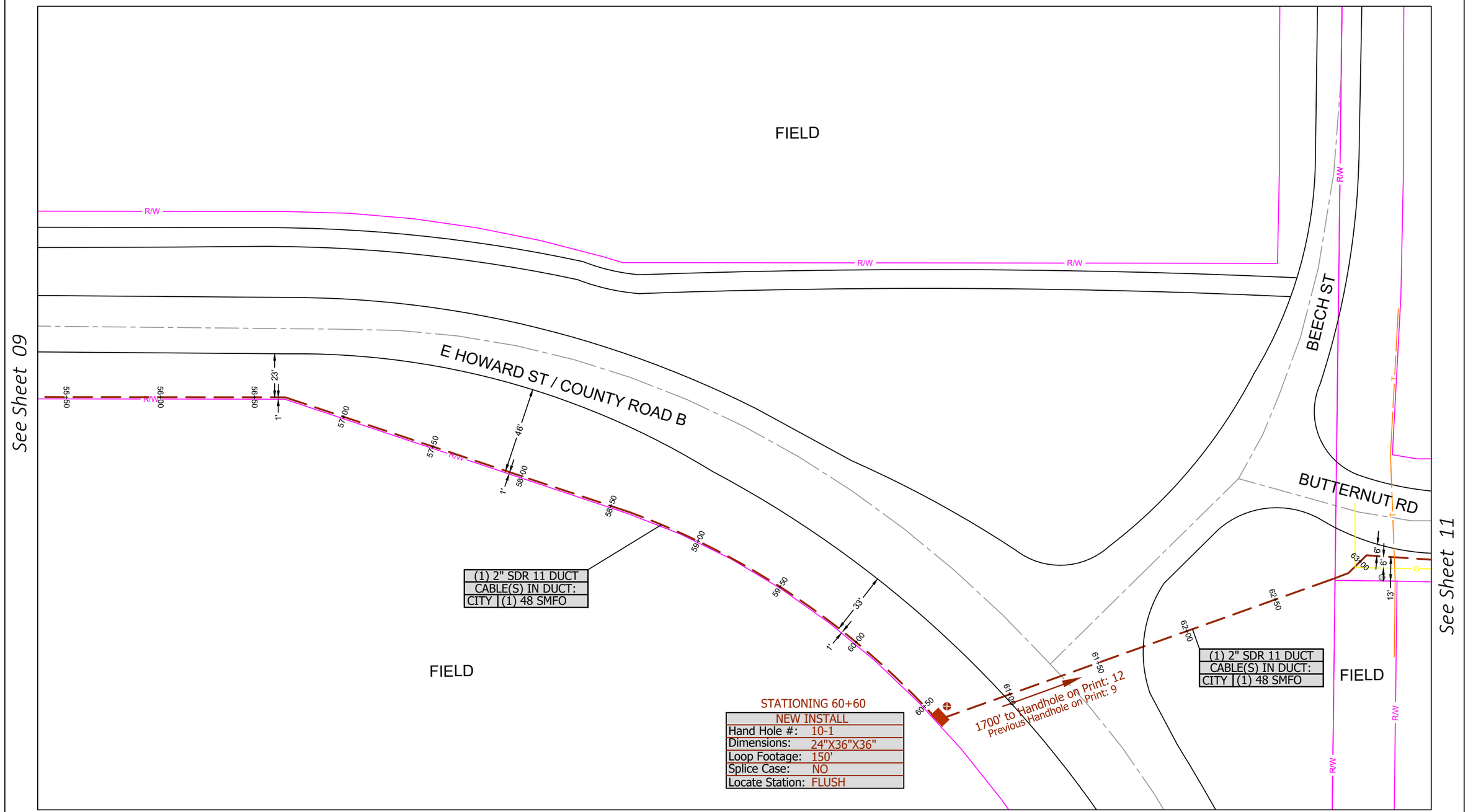
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 09

Permits required on this sheet:



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0 50' 100' N

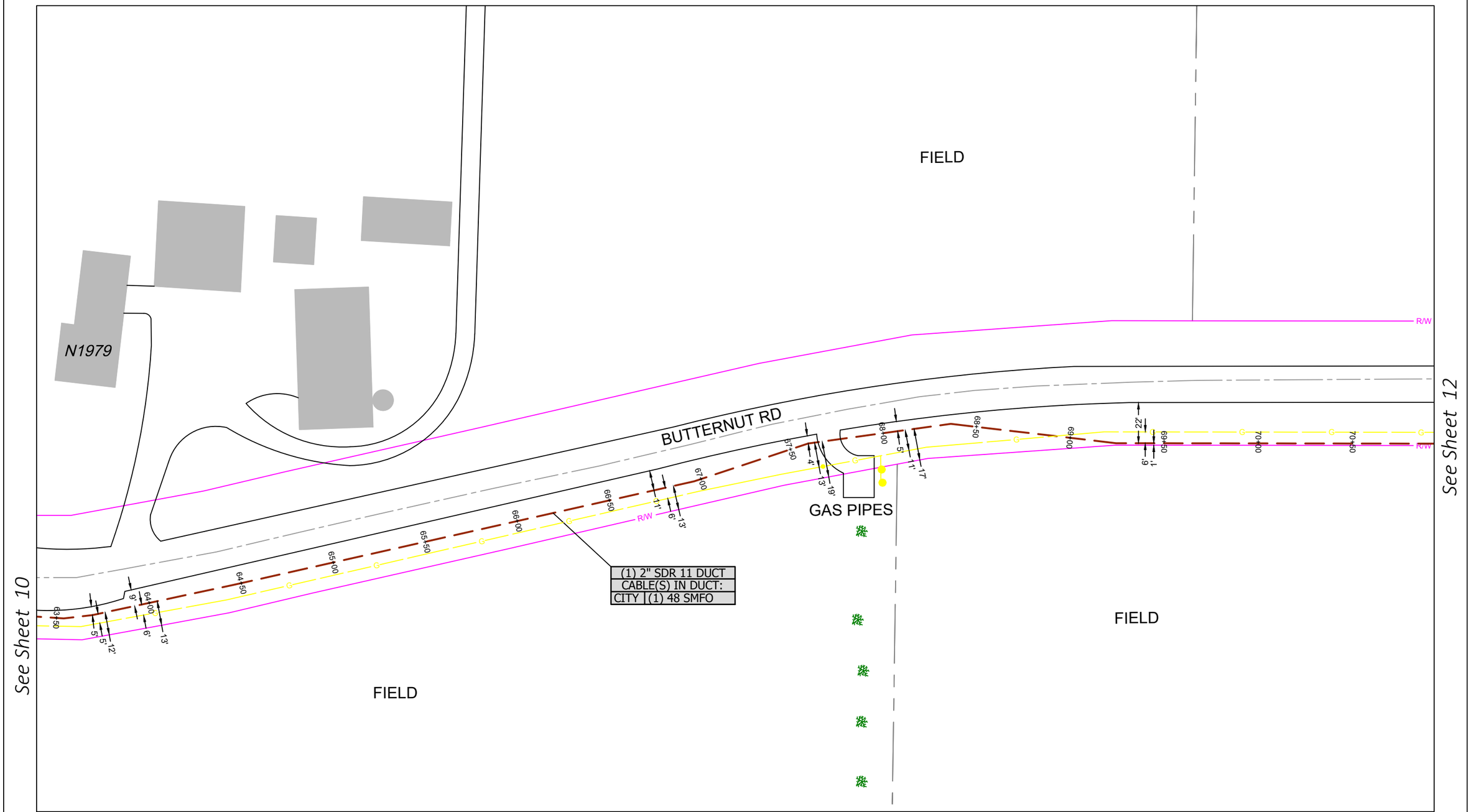
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 10

Permits required on this sheet:



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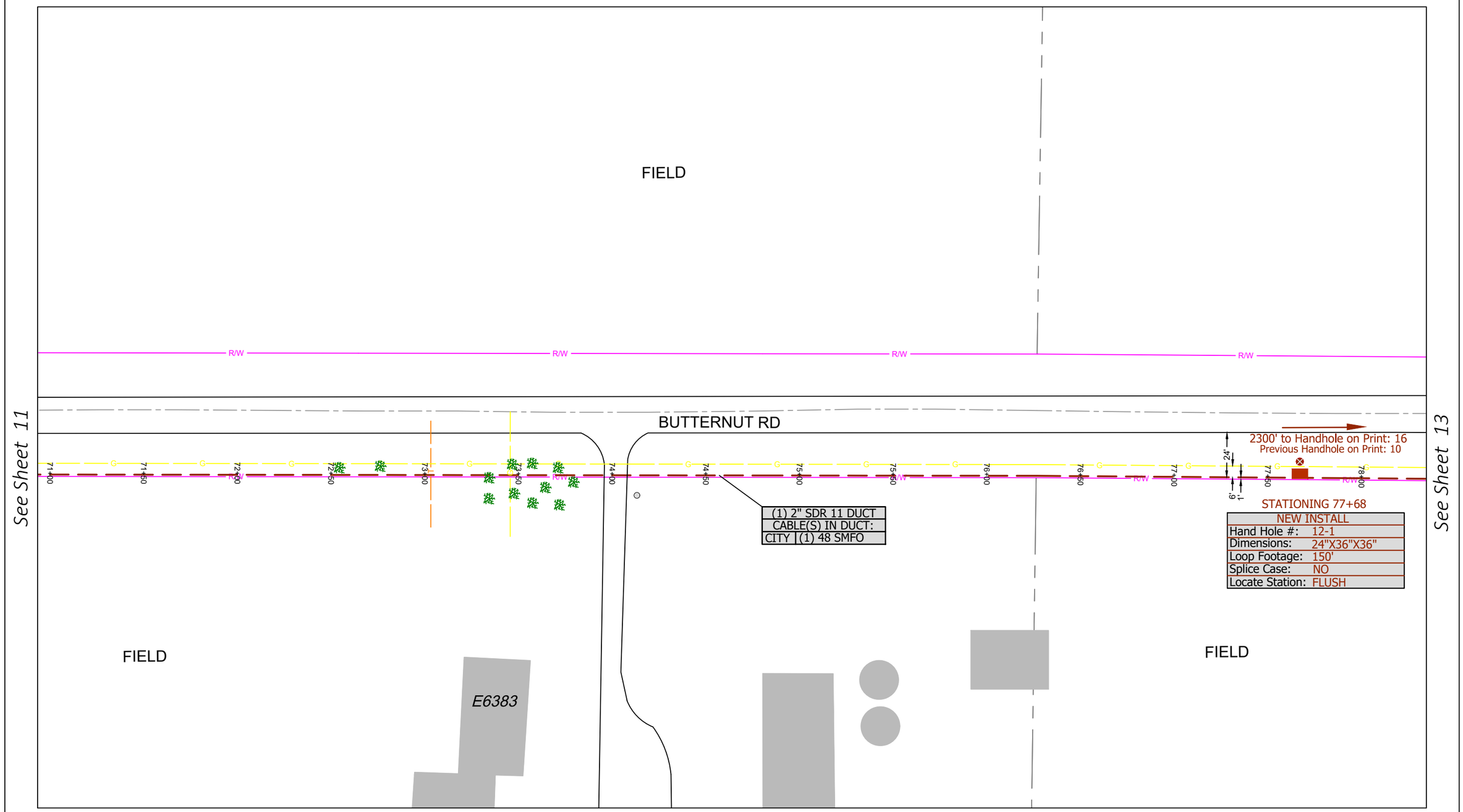

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0 50' 100' N

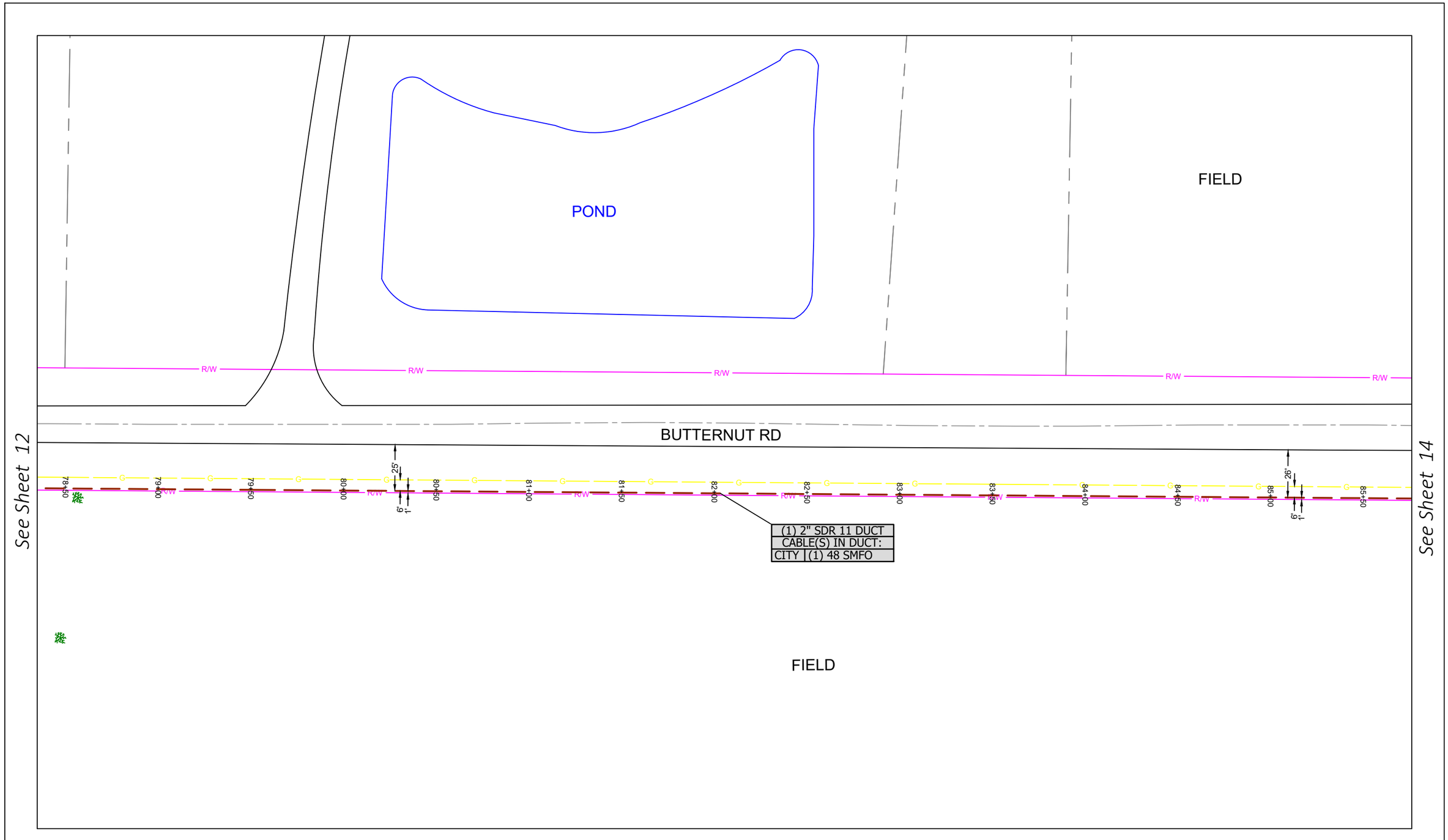
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
12

Permits required on this sheet:



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0 50' 100' N

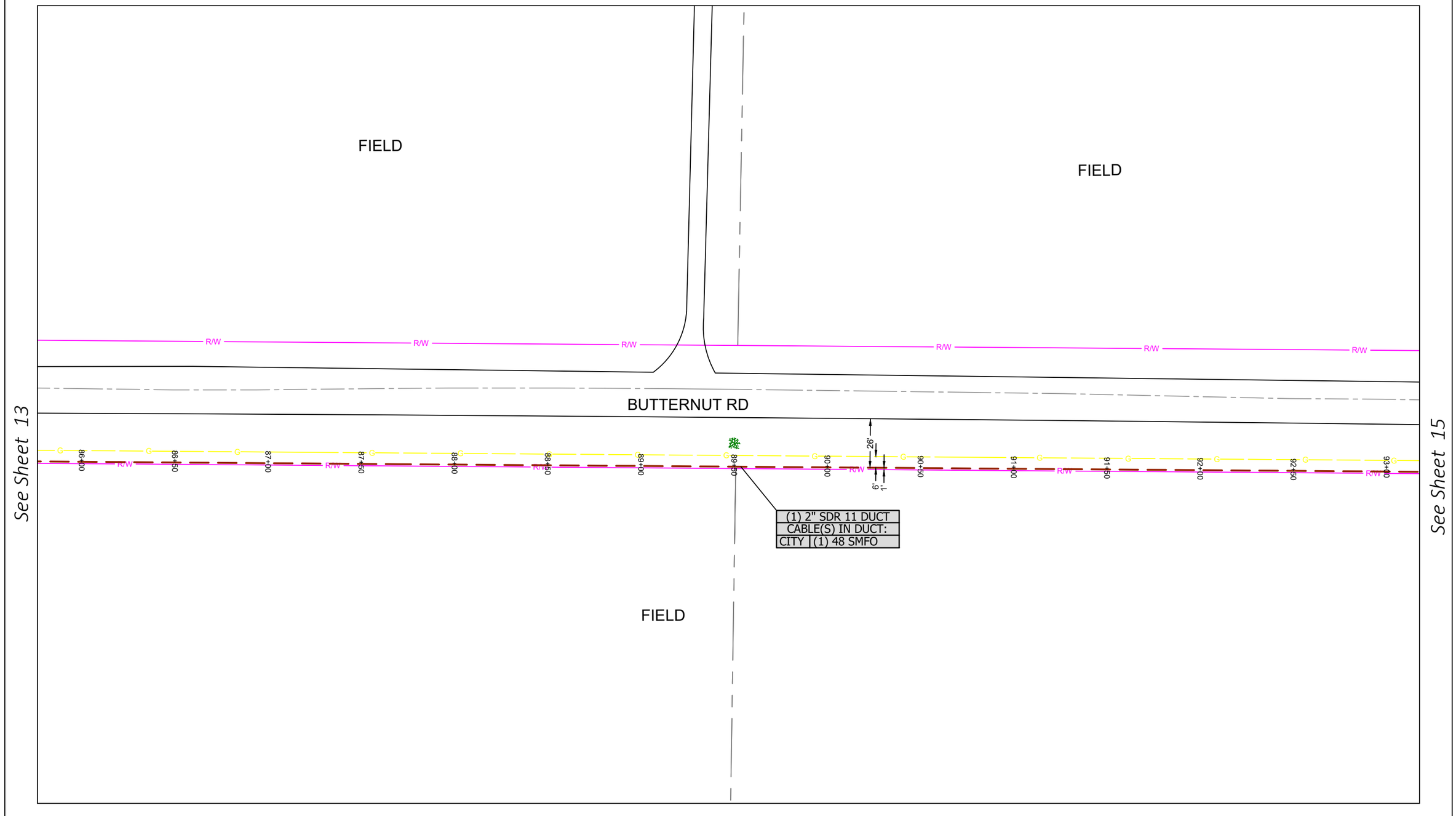
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
13

Permits required on this sheet:



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Fiber Optic Specialists

0 50' 100' N

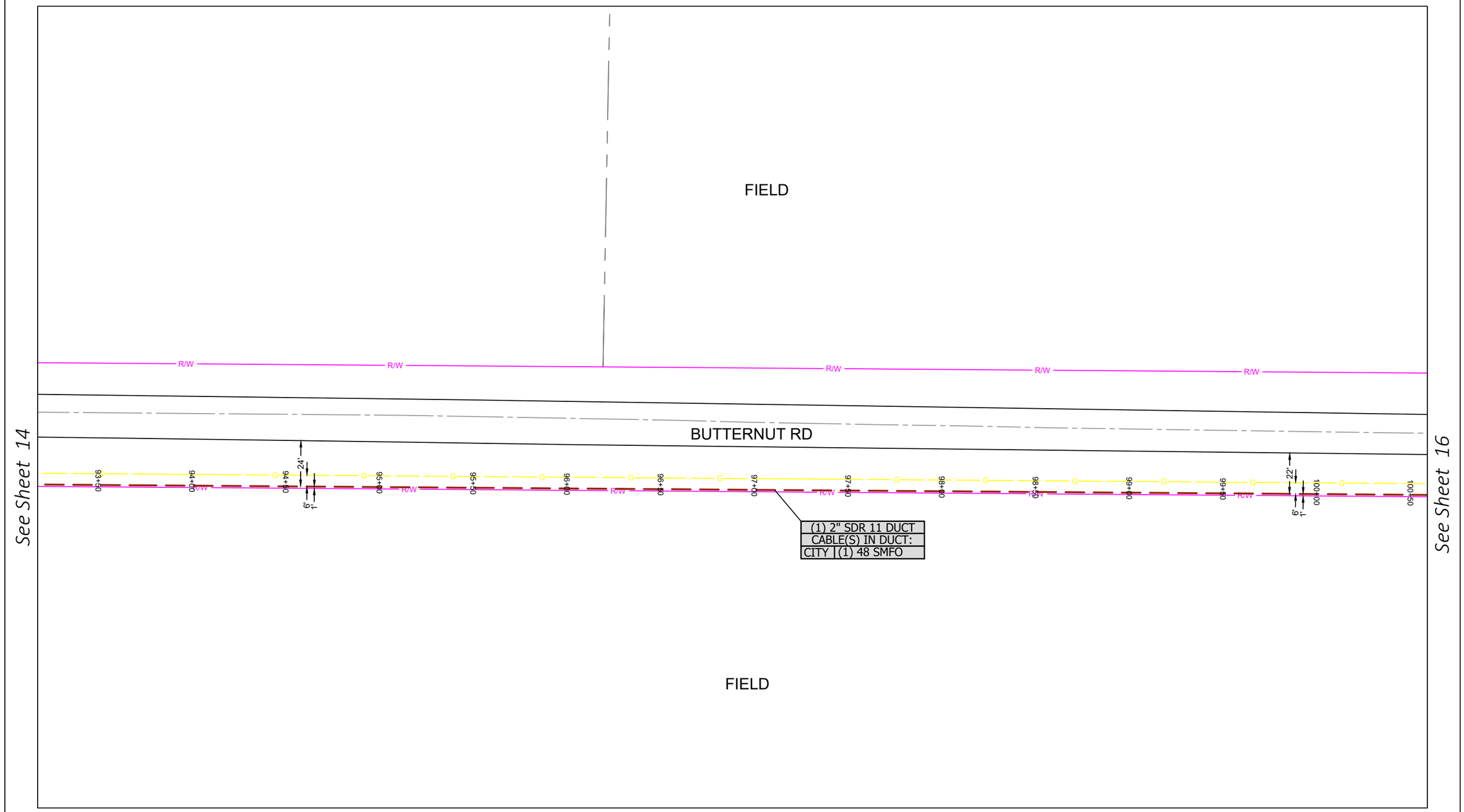
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
14

Permits required on this sheet:



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0 50' 100' N

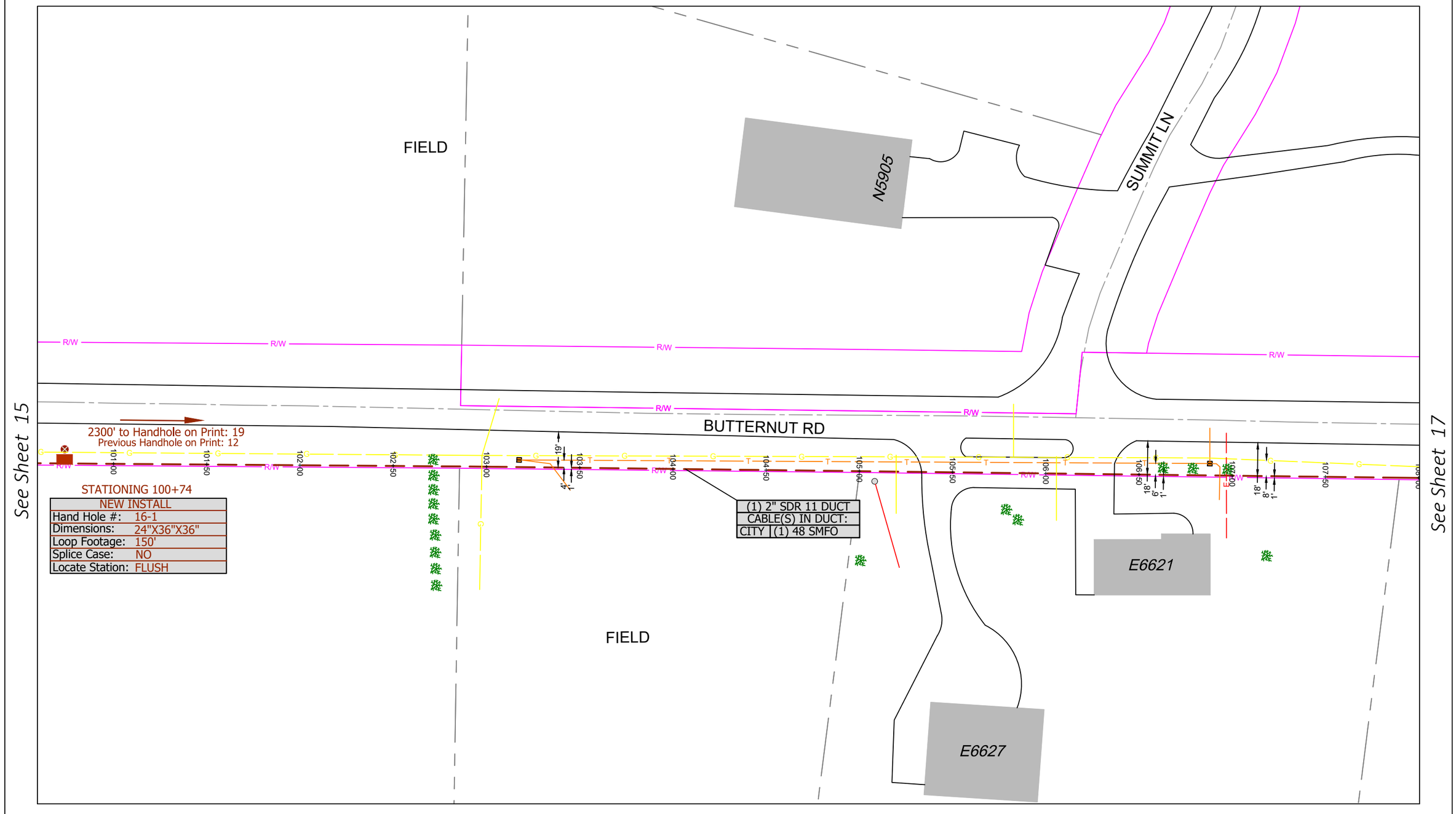
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
15

Permits required on this sheet:



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0 50' 100' N

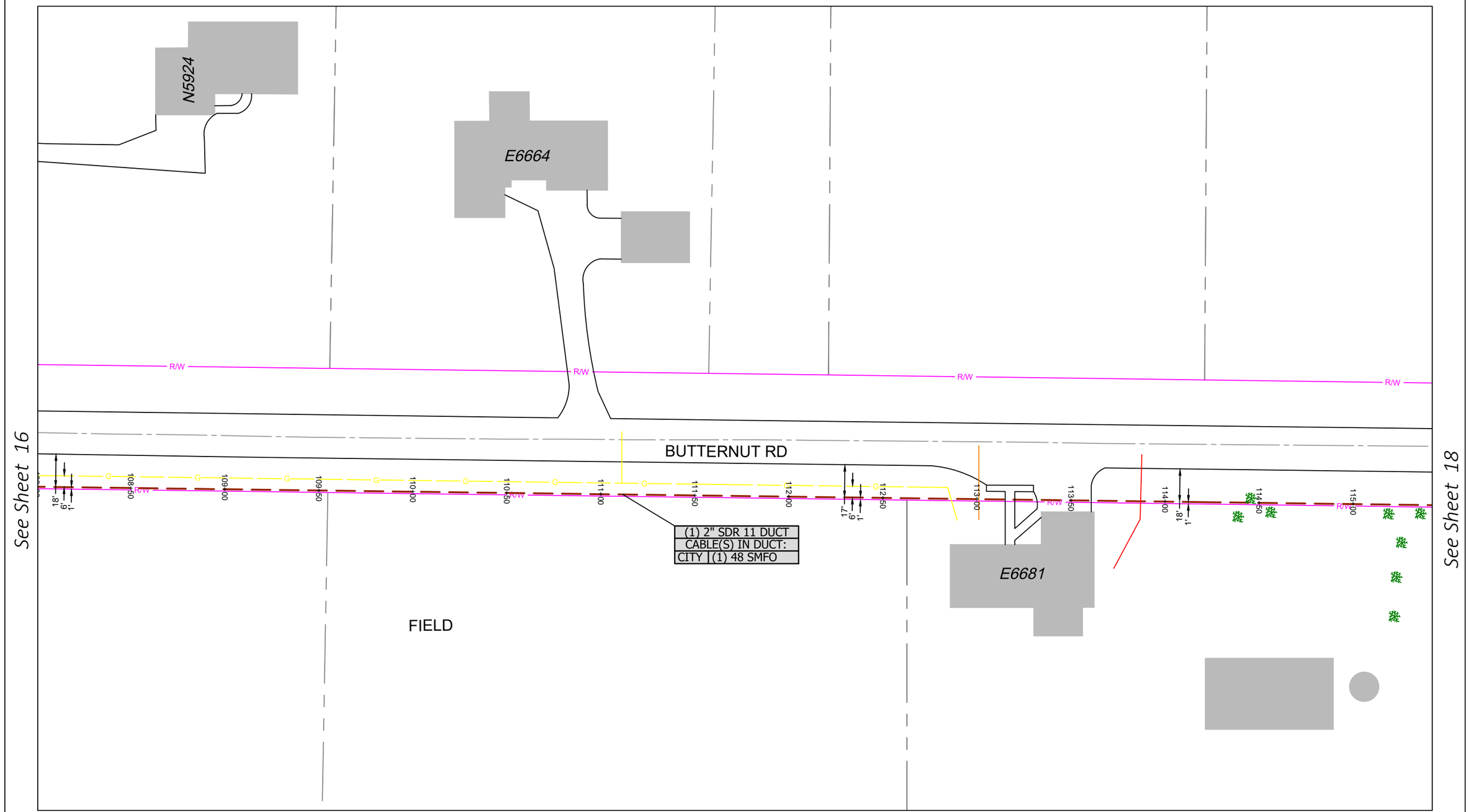
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 16

Permits required on this sheet:



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Permits required on this sheet:

See Sheet 17

See Sheet 19

E6756

R/W

R/W

R/W

R/W

BUTTERNUT RD

8'

7'

115+50

116+00

116+50

117+00

117+50

118+00

118+50

119+00

119+50

120+00

120+50

121+00

121+50

122+00

122+50

R/W

R/W

R/W

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

FIELD

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

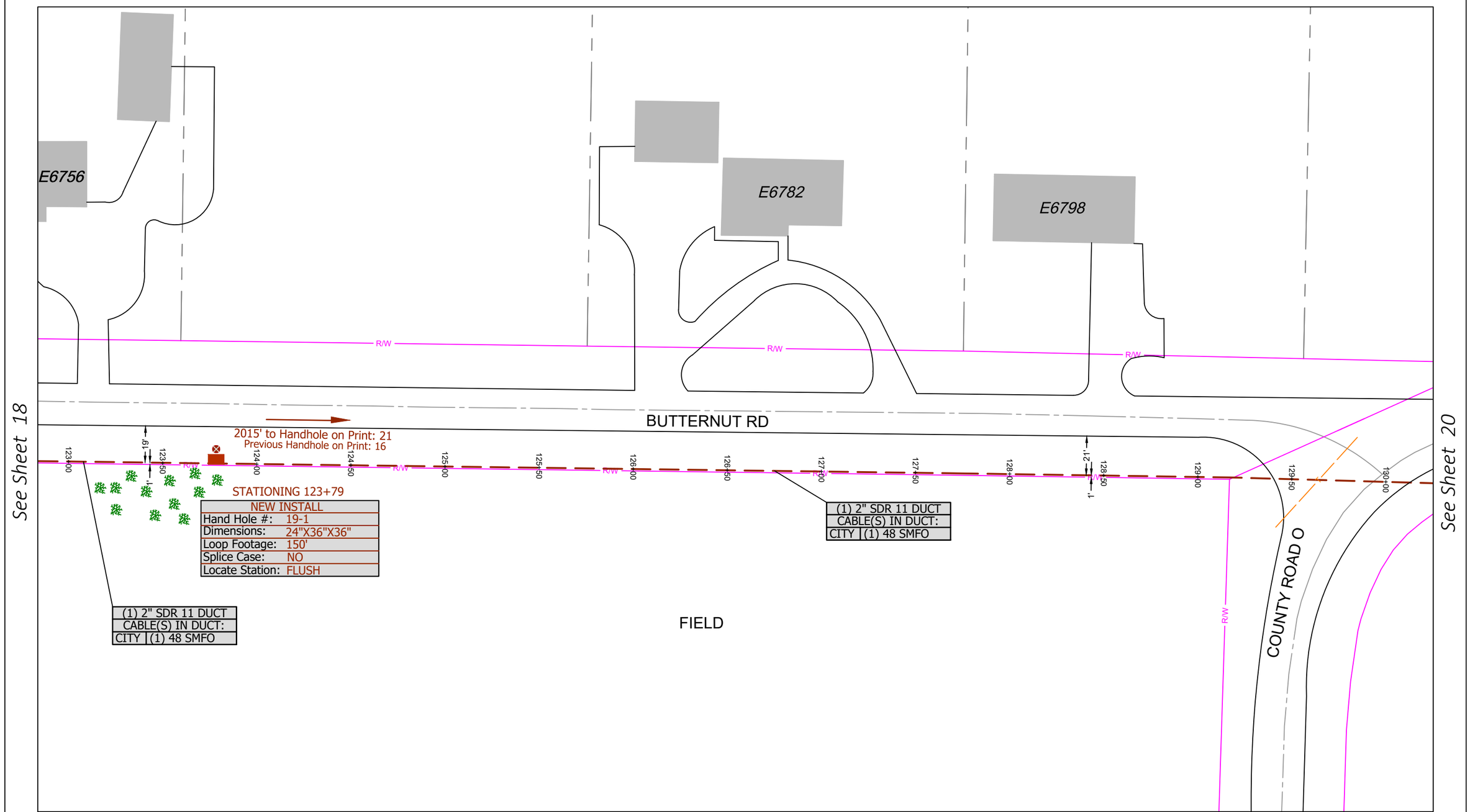
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
18

Permits required on this sheet:



Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

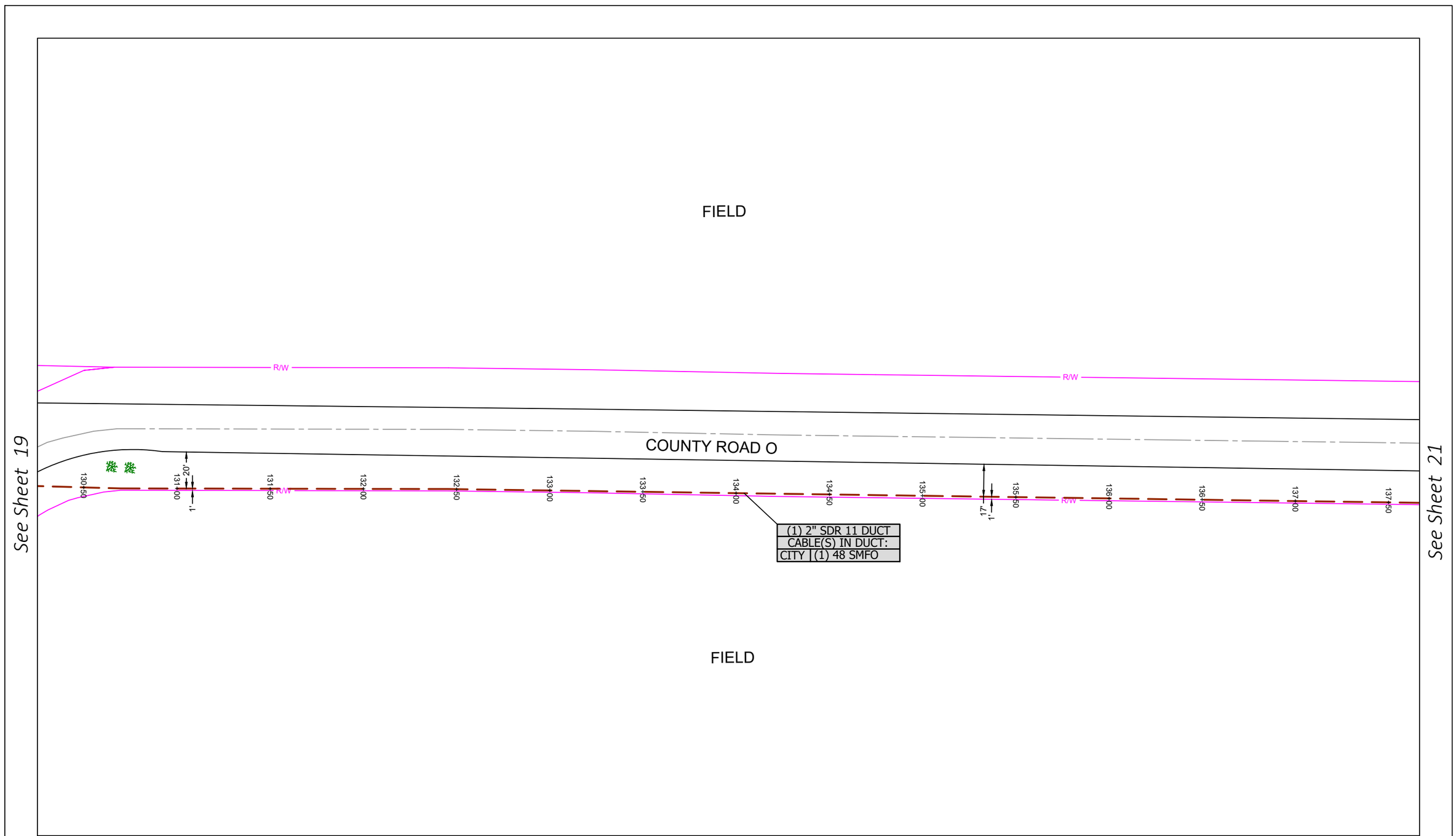
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
19

Permits required on this sheet:



Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

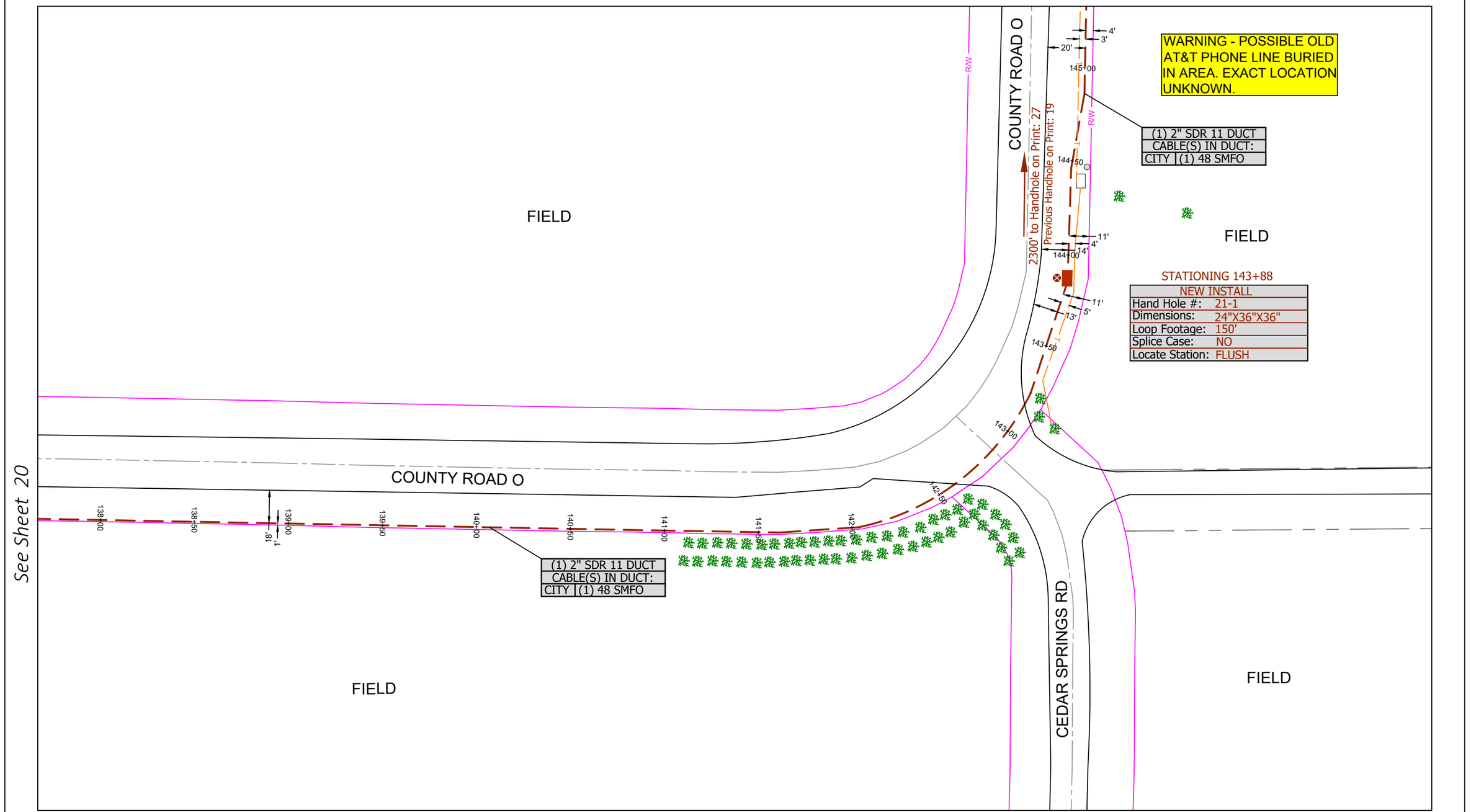
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
20

Permits required on this sheet:

See Sheet 22

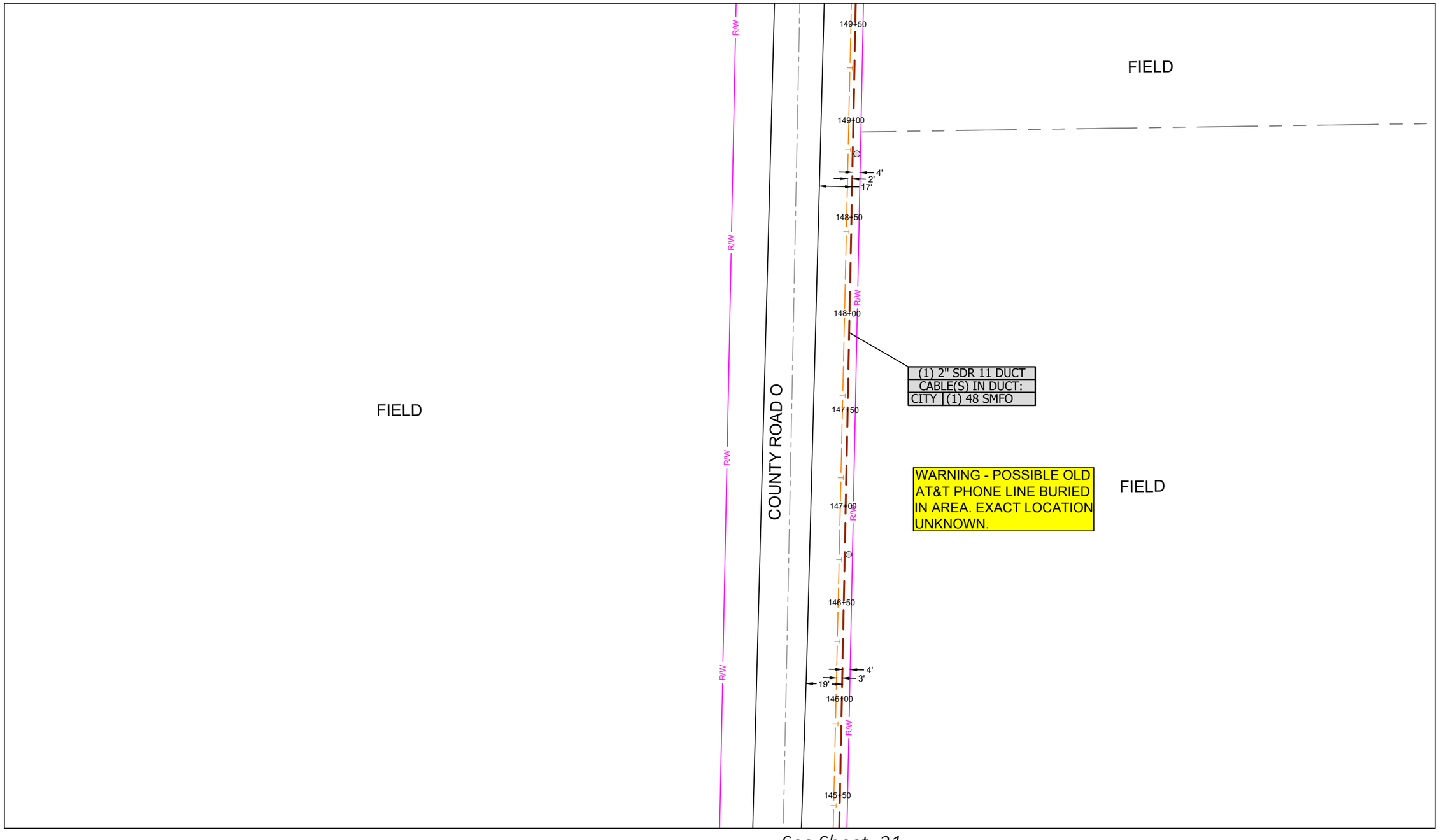


See Sheet 20

Fiber Optic Specialists	Multimedia Communications & Engineering, Inc. PO Box 11064 Green Bay, WI 54307 P: 920.393.3492 I 877.870.6968	0 50' 100' N *Scale: 1" = 50' ANSI B/Tabloid*	SYMCO TOWER CONNECT 06/05/2018	Sheet Group: 1:50 Scaled Plans	Sheet ID: 21

Permits required on this sheet:

See Sheet 23



See Sheet 21

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

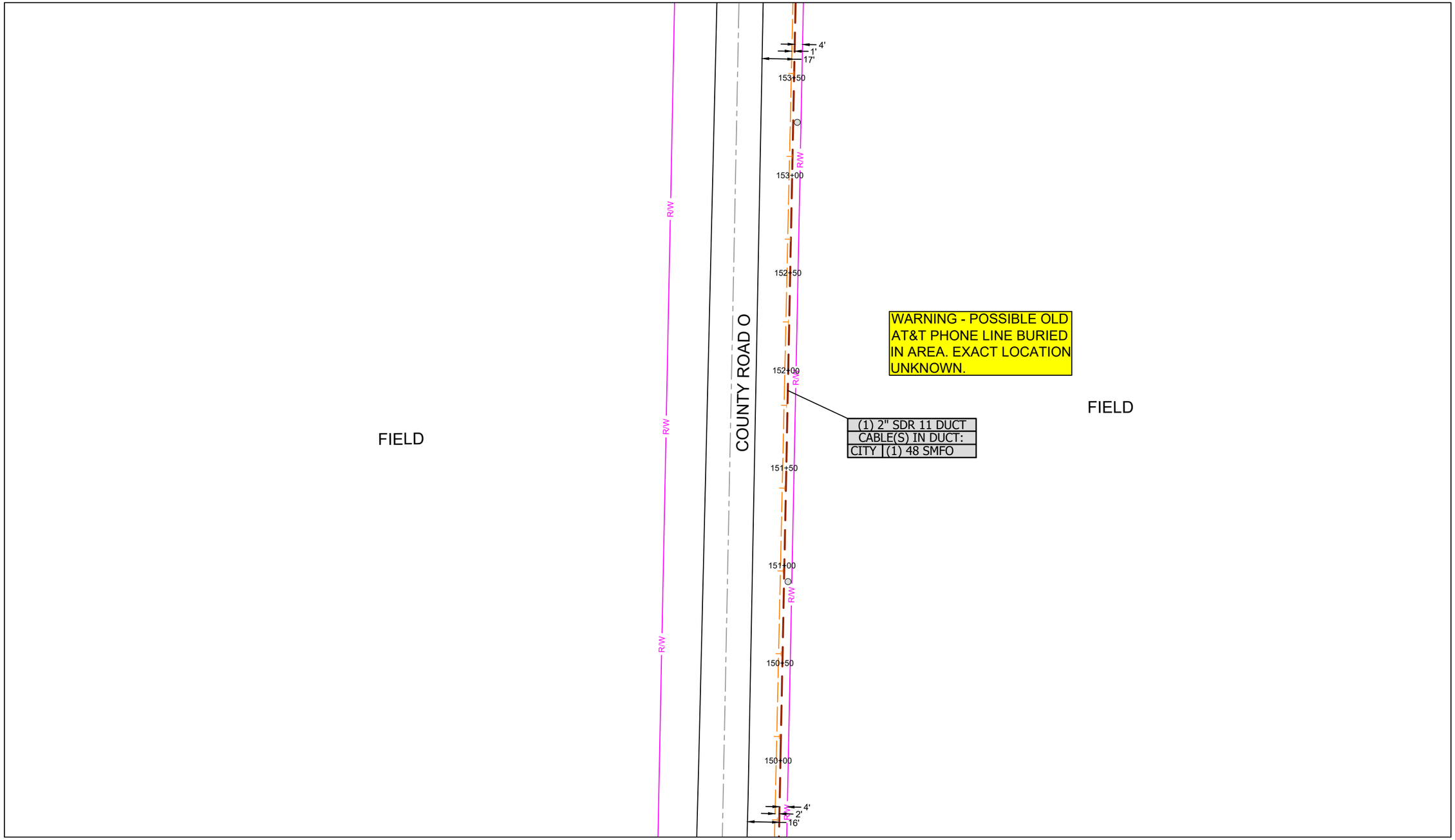
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 22

Permits required on this sheet:

See Sheet 24



See Sheet 22

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

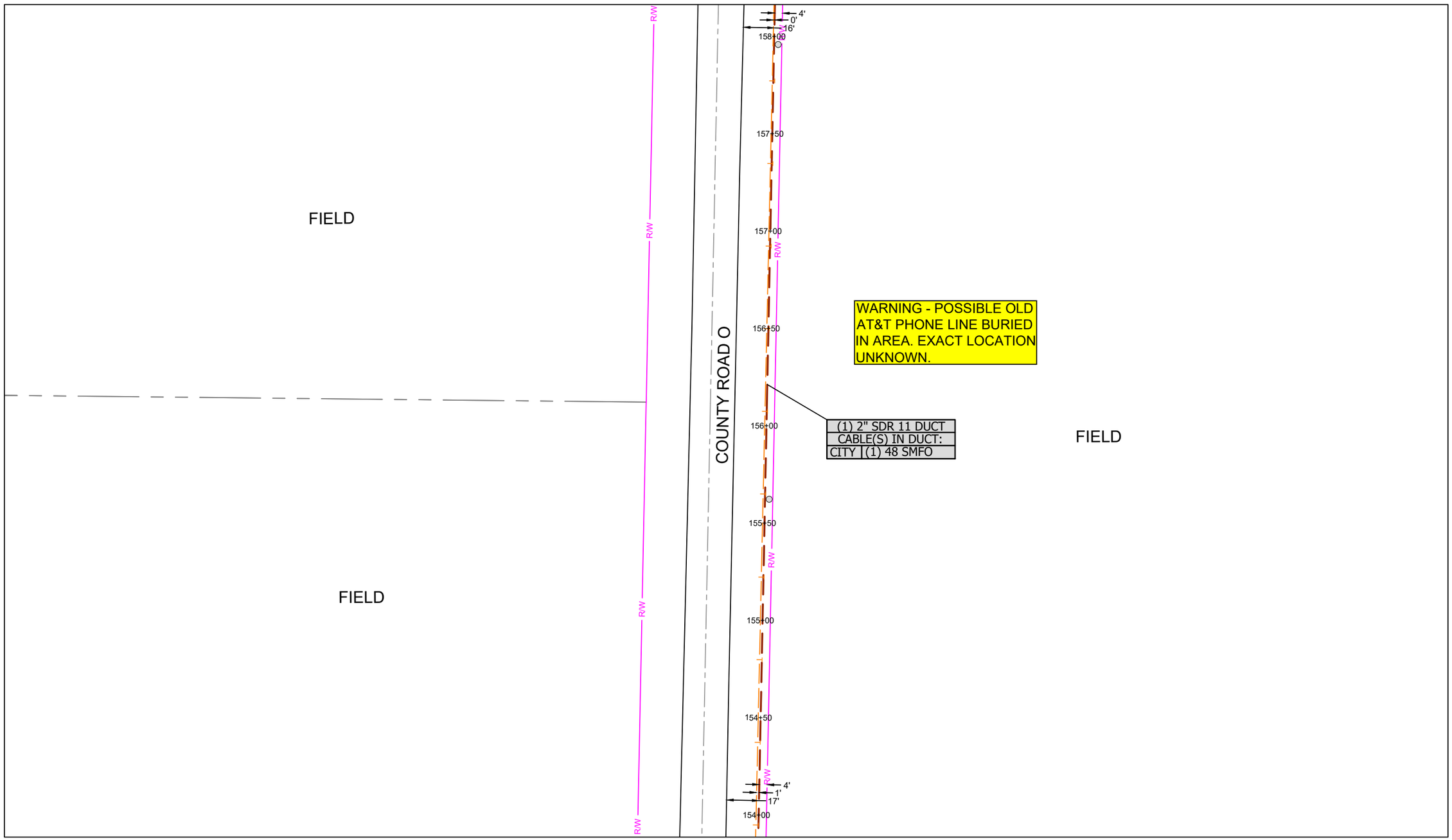
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 23

Permits required on this sheet:

See Sheet 25



See Sheet 23

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

Scale: 1" = 50' ANSI B/Tabloid (0, 50', 100')

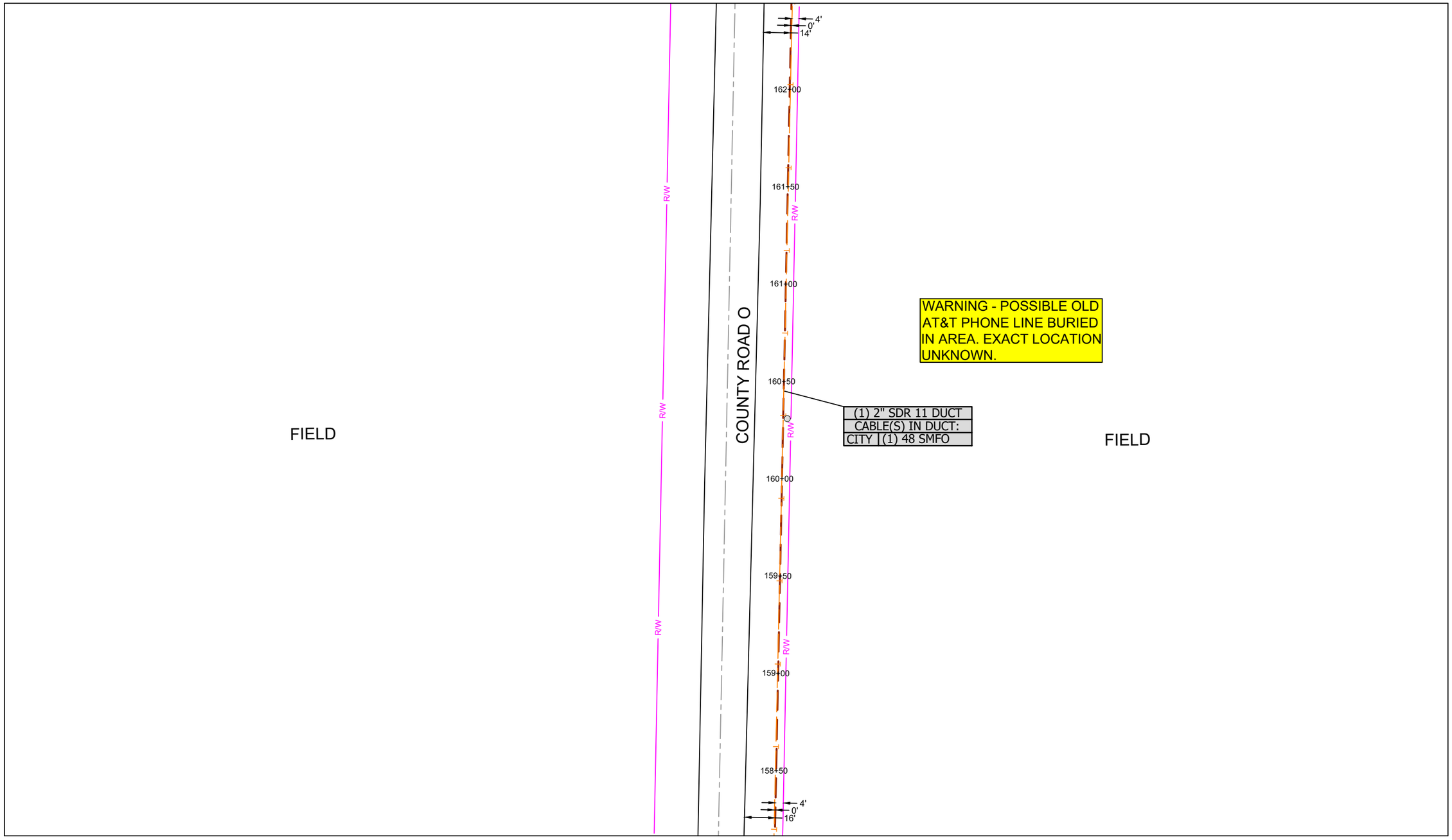
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 24

Permits required on this sheet:

See Sheet 26



See Sheet 24

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

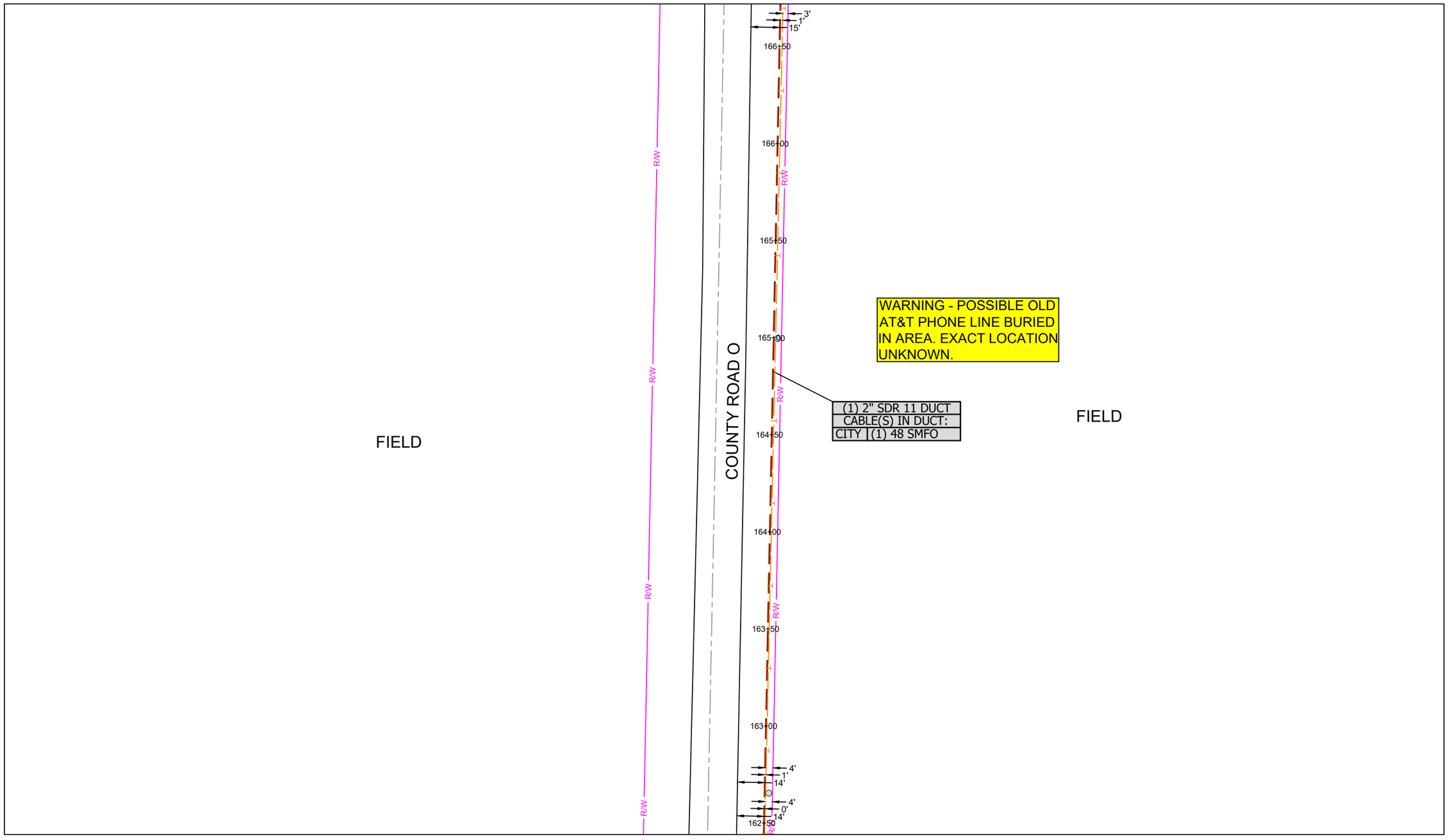
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 25

Permits required on this sheet:

See Sheet 27



See Sheet 25

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

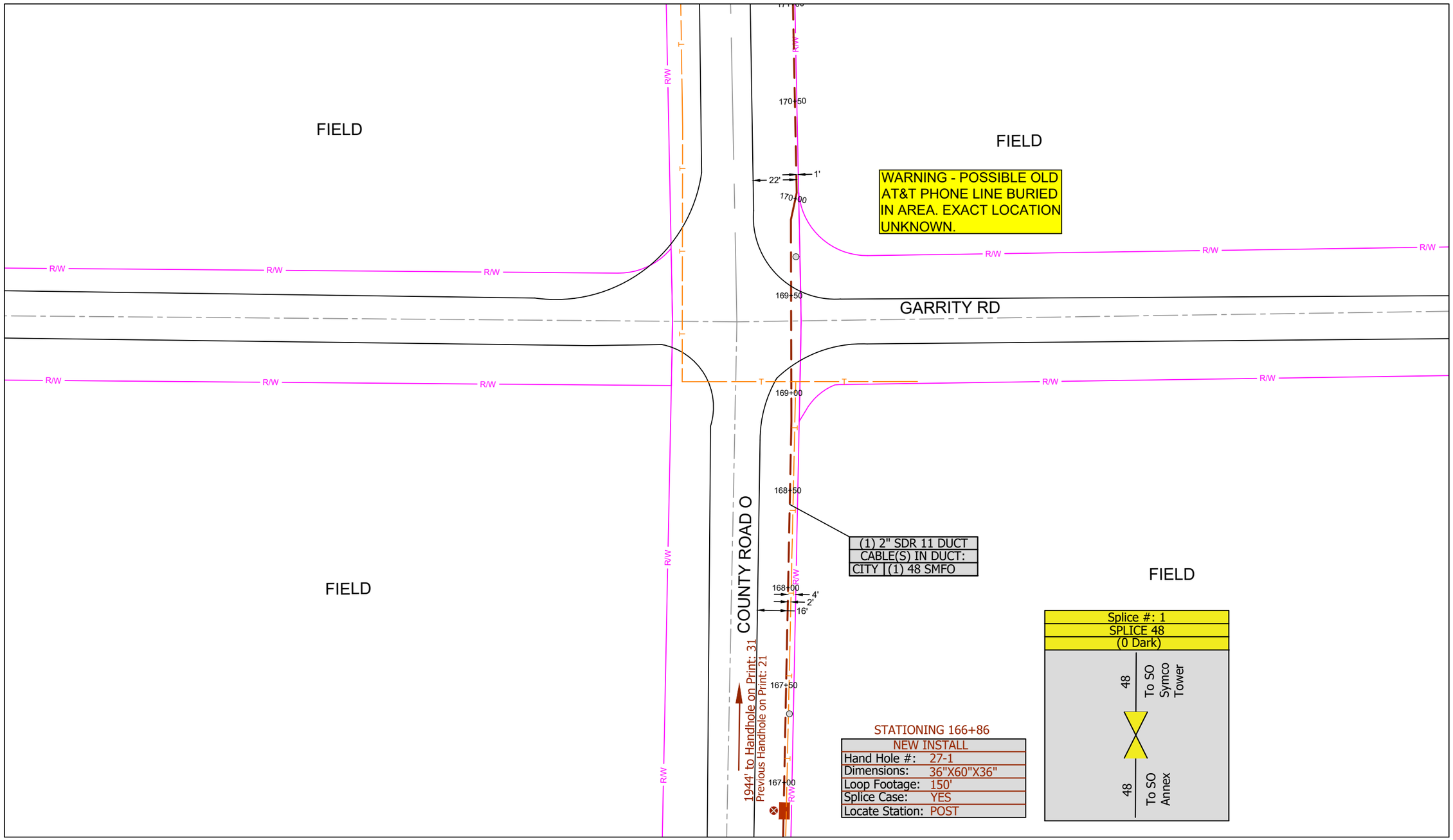
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 26

Permits required on this sheet:

See Sheet 28



See Sheet 26

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

Scale: 1" = 50' ANSI B/Tabloid (0, 50', 100')

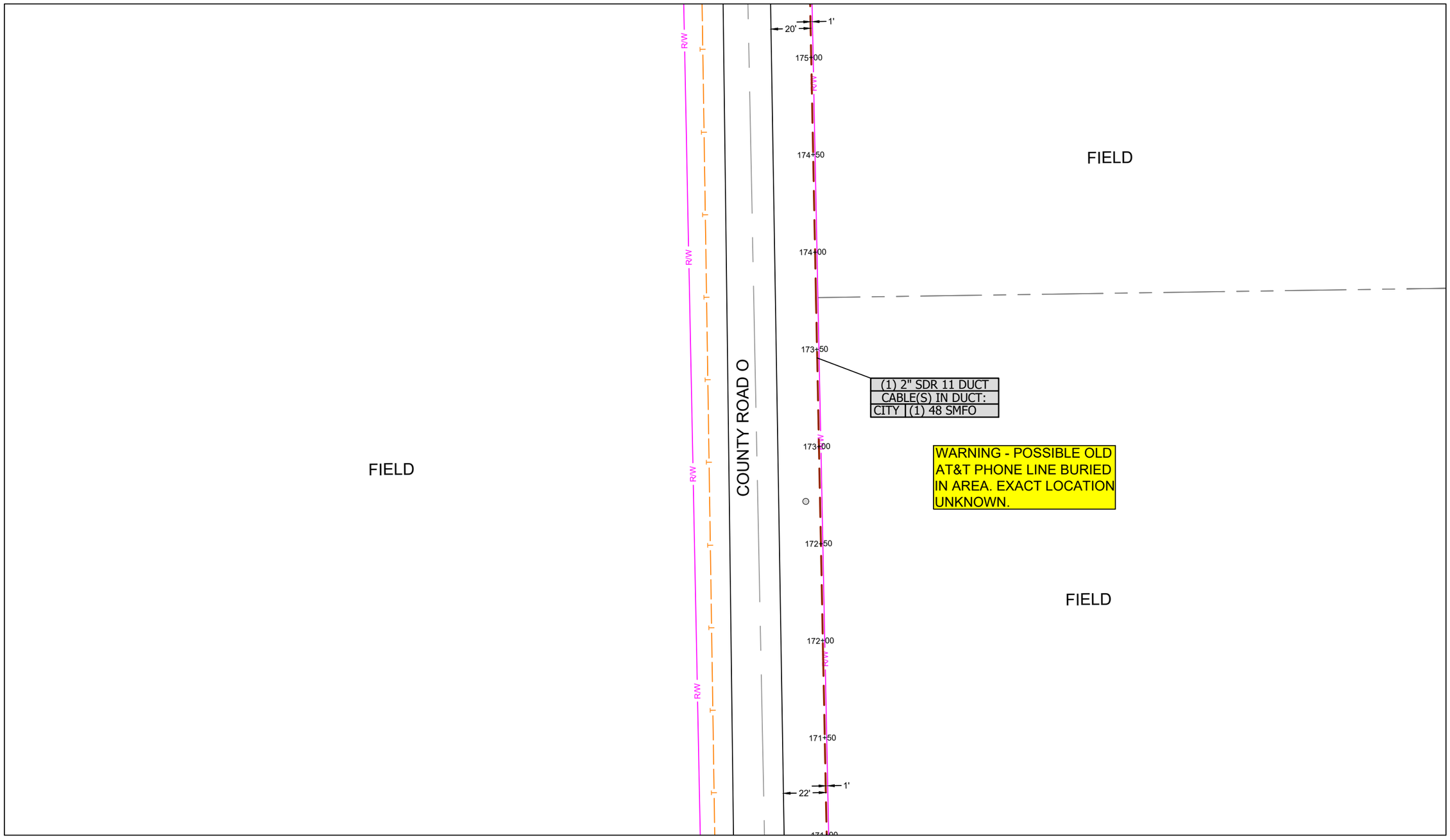
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 27

Permits required on this sheet:

See Sheet 29



See Sheet 27

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

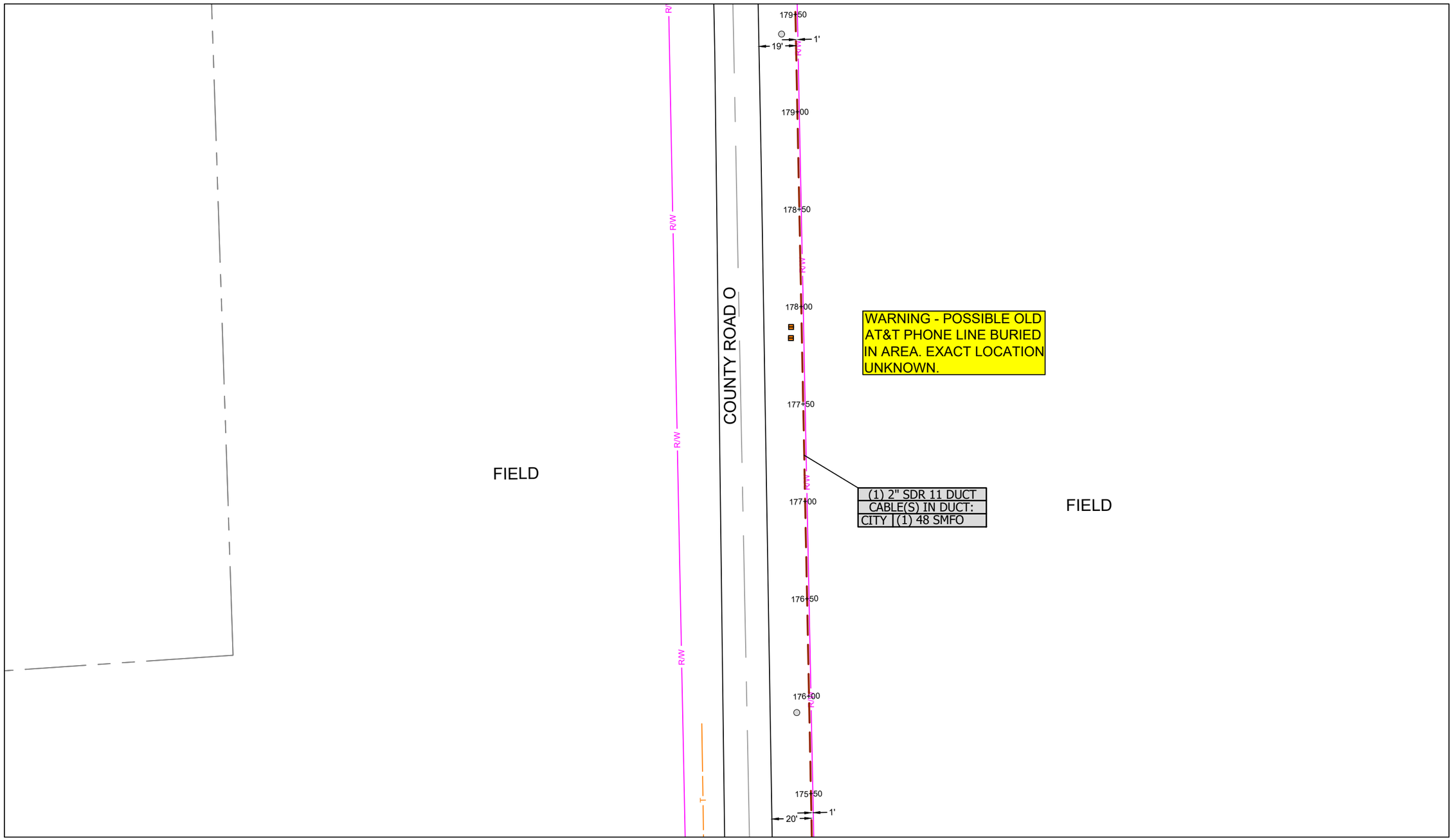
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 28

Permits required on this sheet:

See Sheet 30



See Sheet 28

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 29

Permits required on this sheet:

See Sheet 31

See Sheet 07

RW

RW

RW

RW

RW

19'

1'

183+50

183+00

182+50

182+00

181+50

181+00

180+50

180+00

19'

1'

COUNTY ROAD O

FIELD

FIELD

FIELD

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

WARNING - POSSIBLE OLD AT&T PHONE LINE BURIED IN AREA. EXACT LOCATION UNKNOWN.

See Sheet 29

Multimedia Communications & Engineering, Inc.
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P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

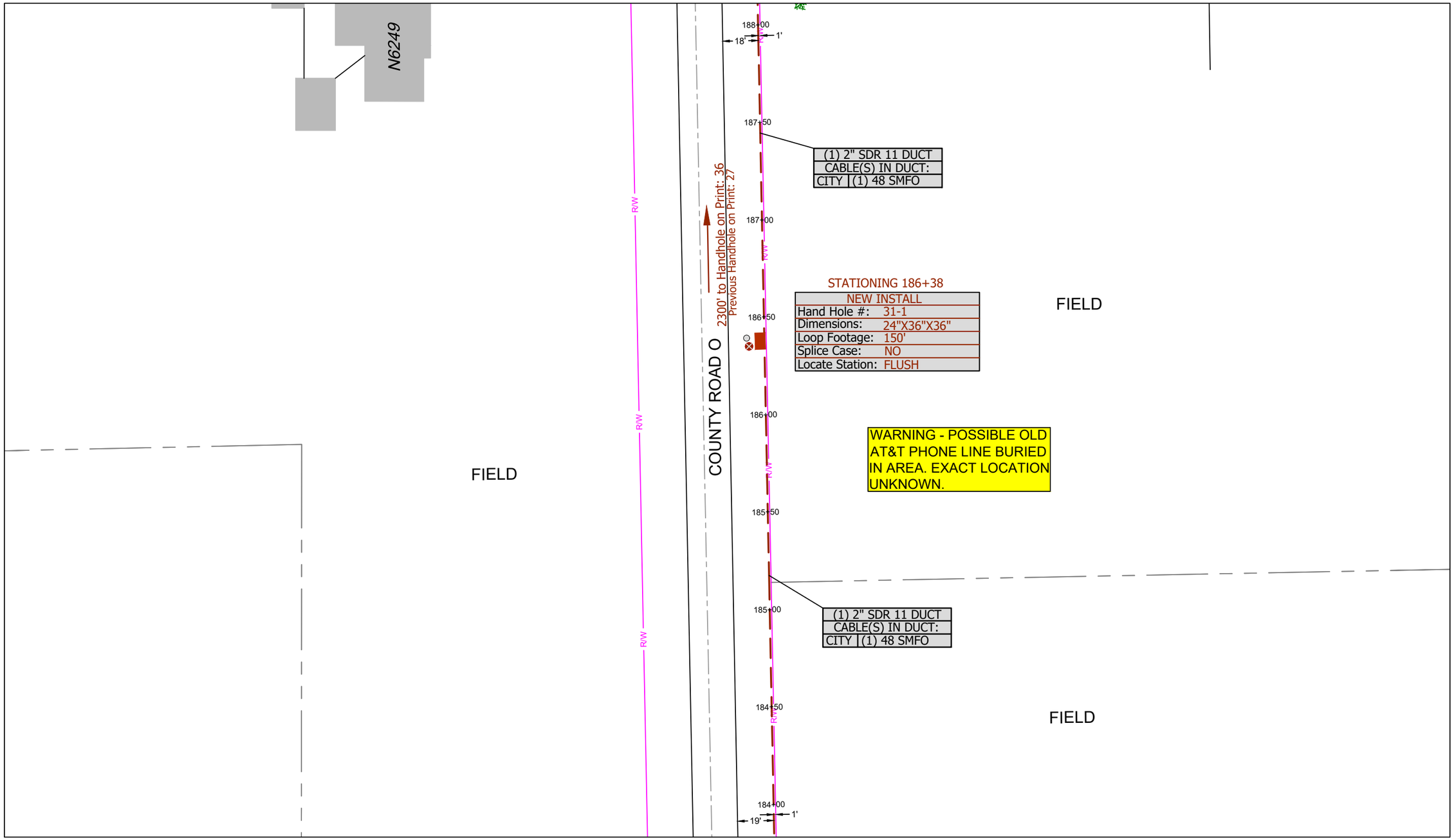
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
30

Permits required on this sheet:

See Sheet 32



See Sheet 30

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

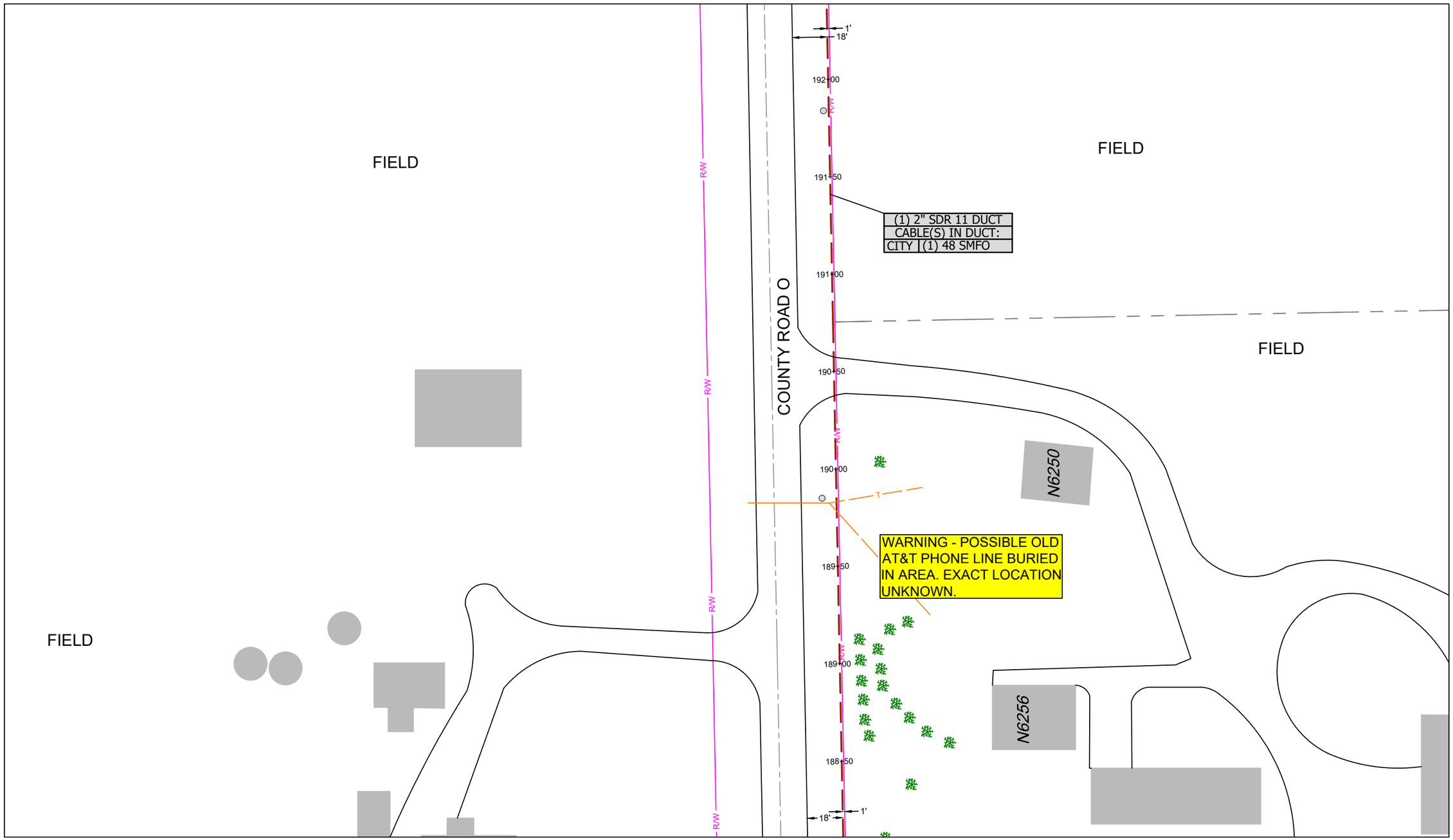
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 31

Permits required on this sheet:

See Sheet 33



See Sheet 31

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

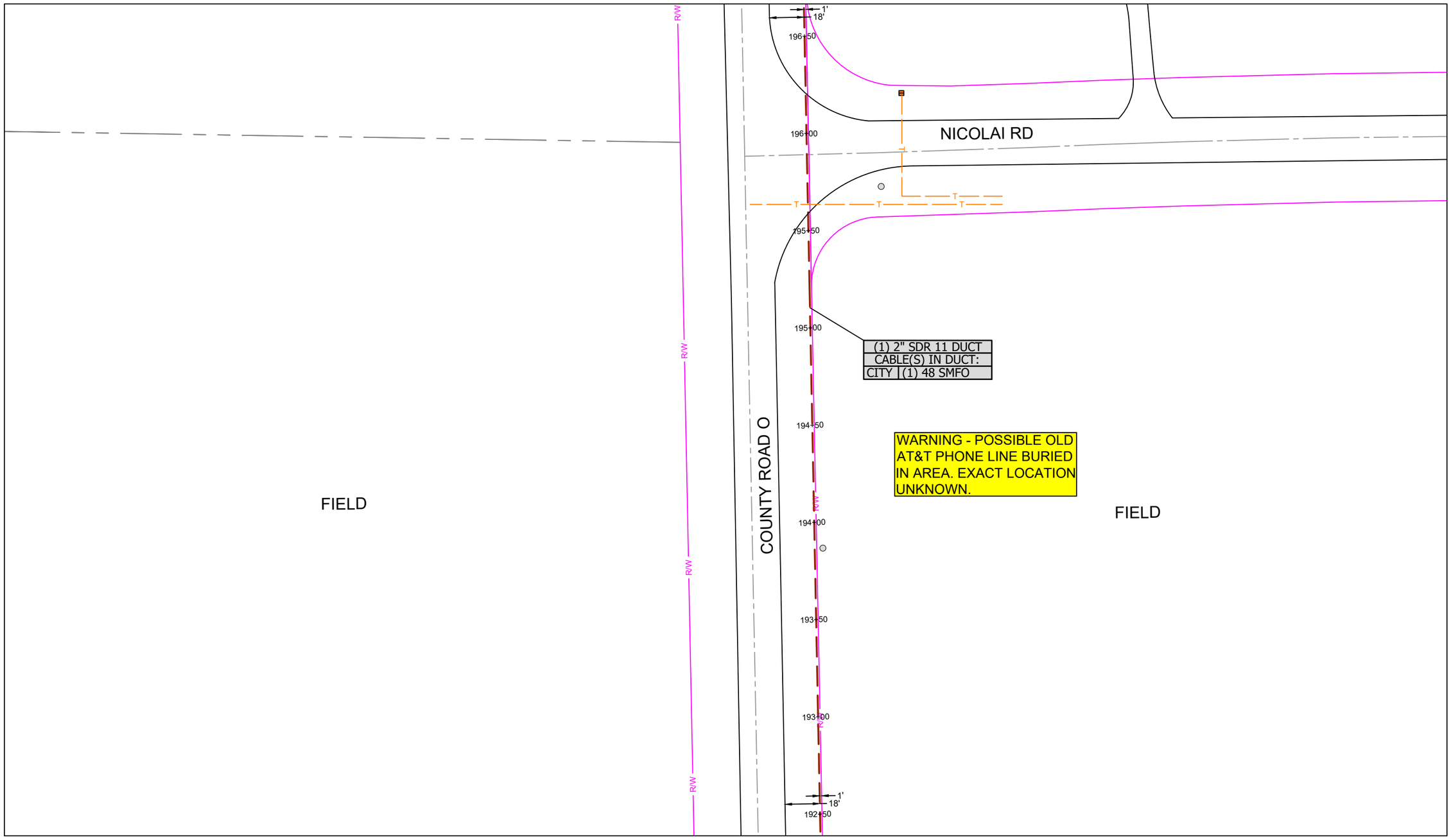
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 32

Permits required on this sheet:

See Sheet 34



See Sheet 32

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

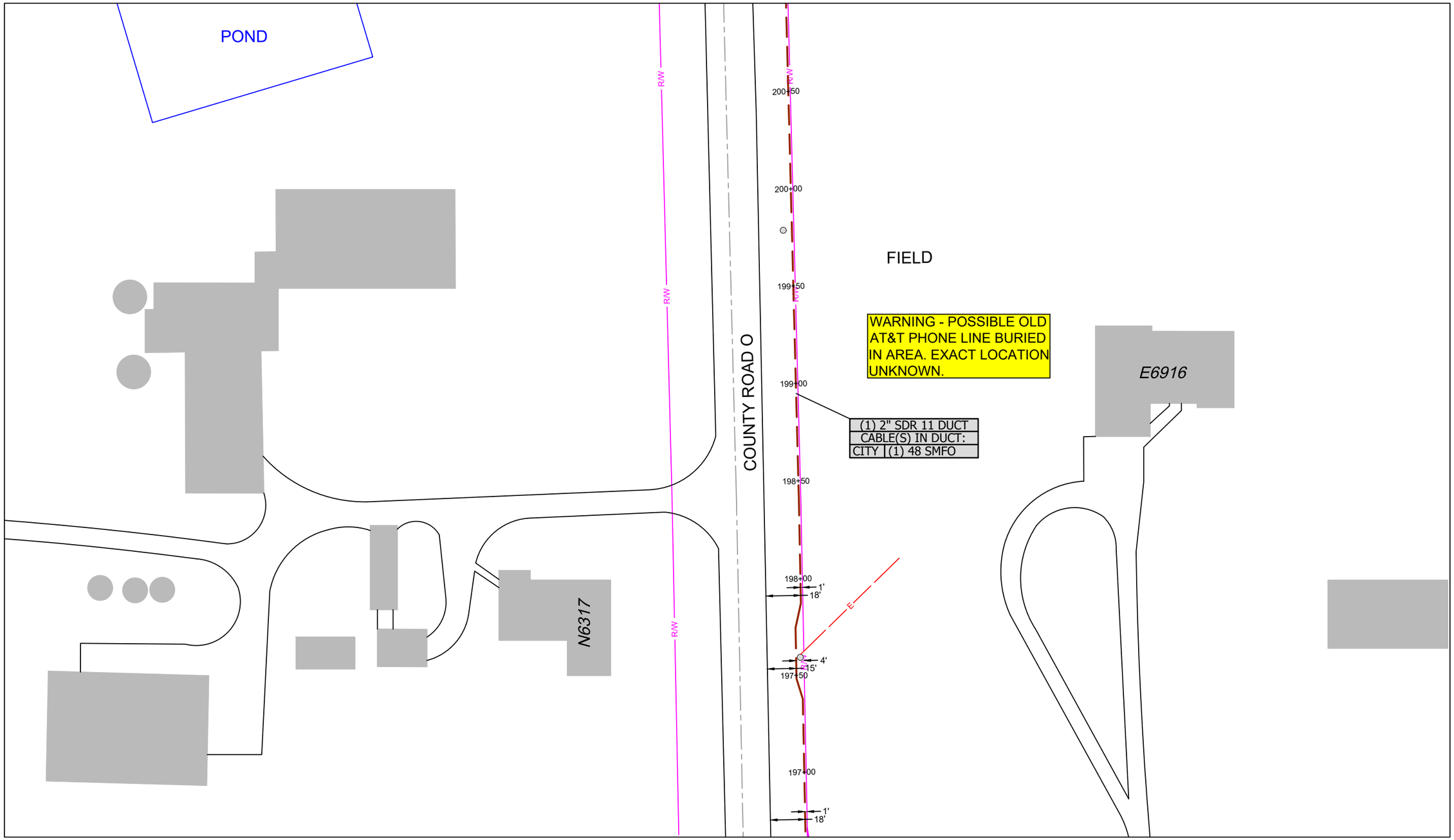
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 33

Permits required on this sheet:

See Sheet 35



See Sheet 33

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

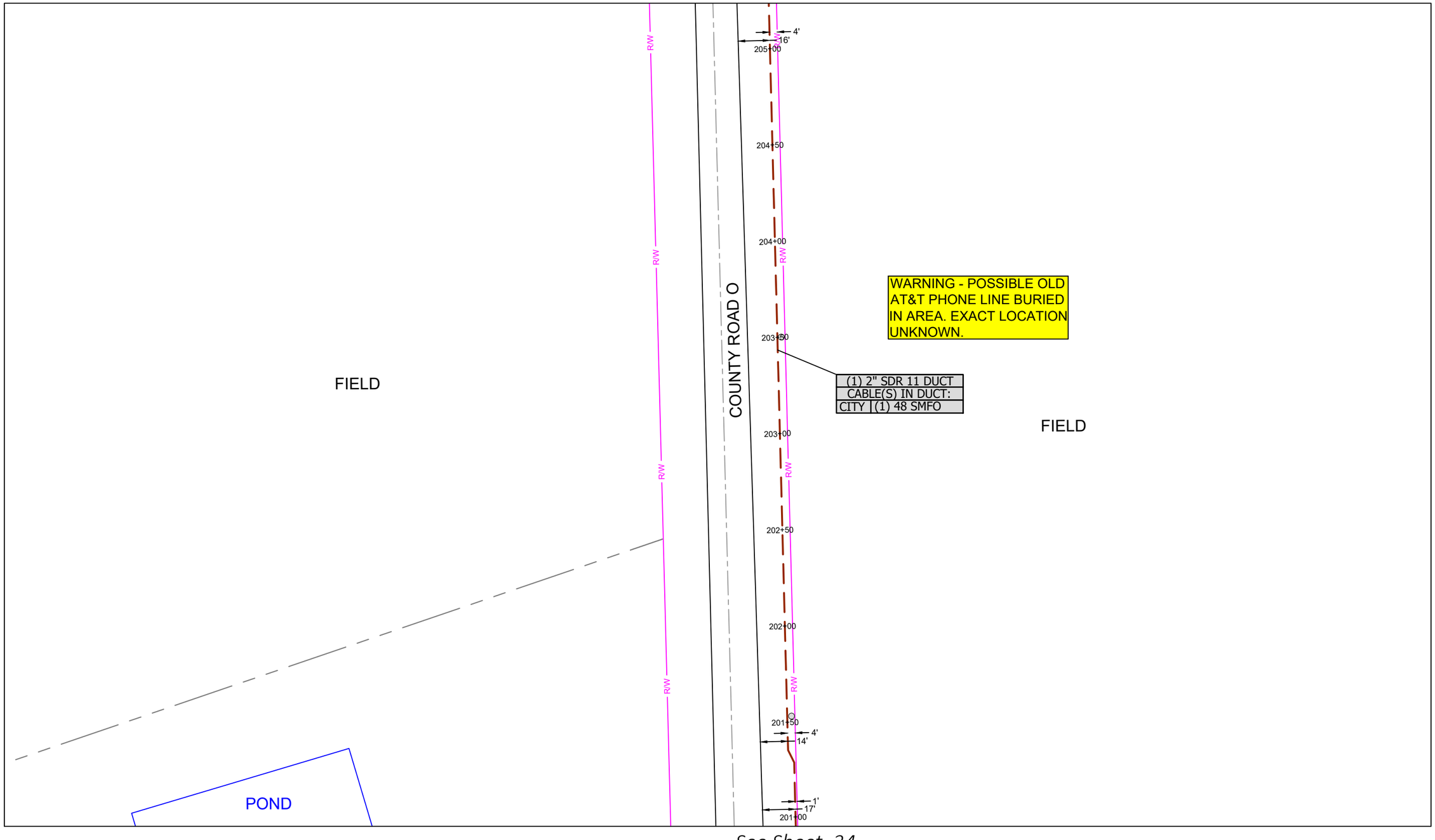
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 34

Permits required on this sheet:

See Sheet 36



See Sheet 34

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

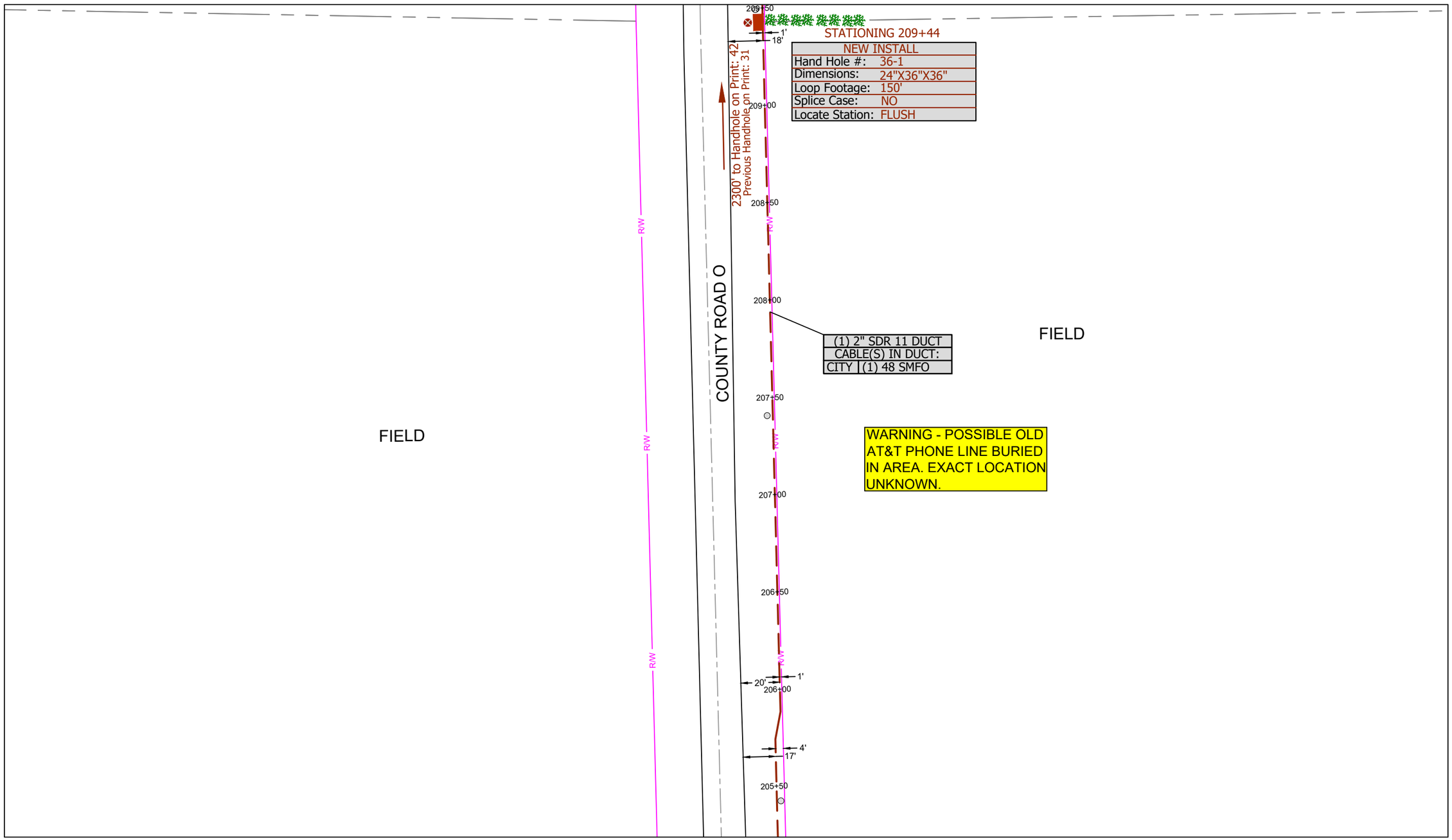
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
35

Permits required on this sheet:

See Sheet 37



See Sheet 35

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

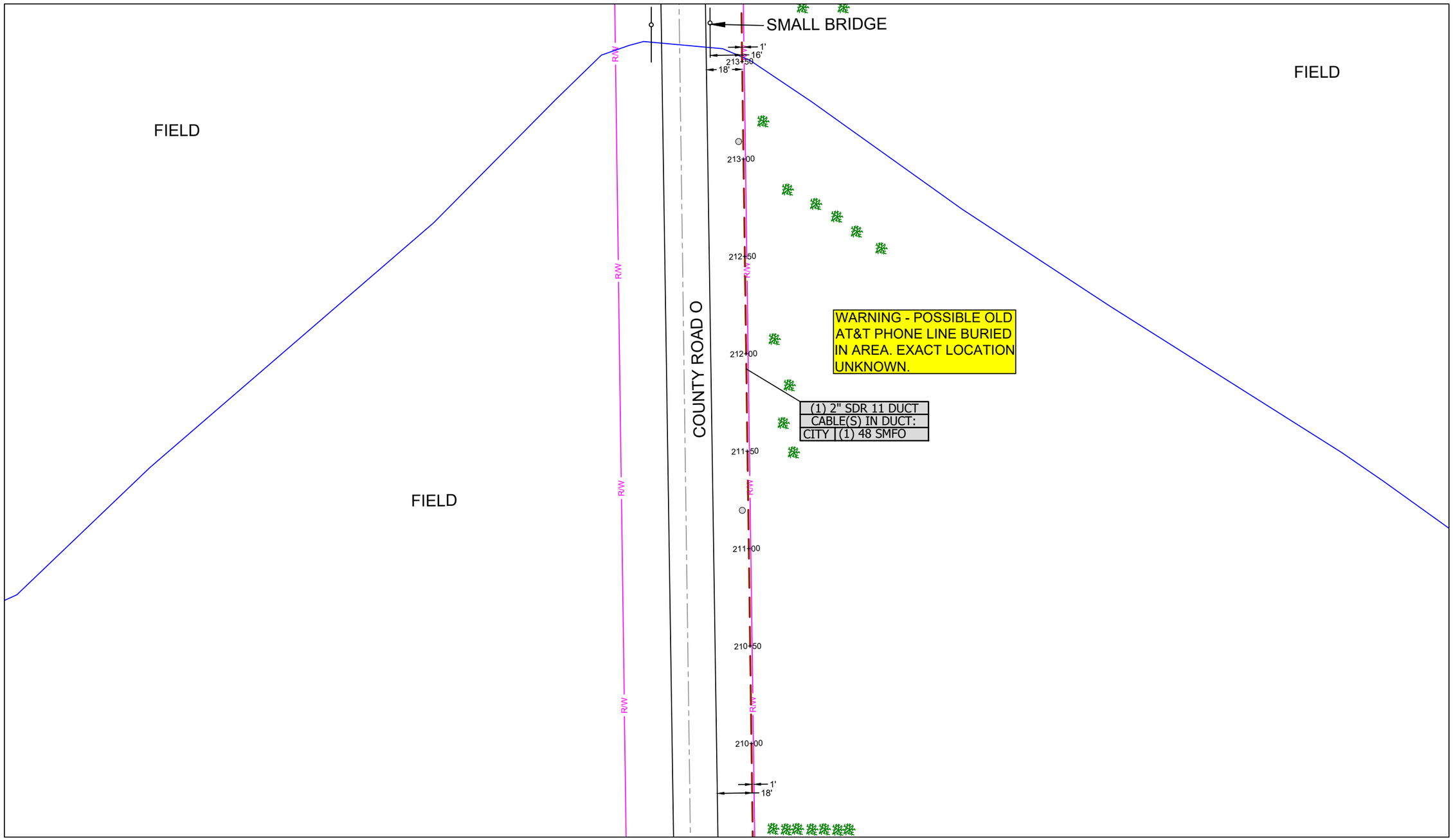
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 36

Permits required on this sheet:

See Sheet 38



See Sheet 36

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

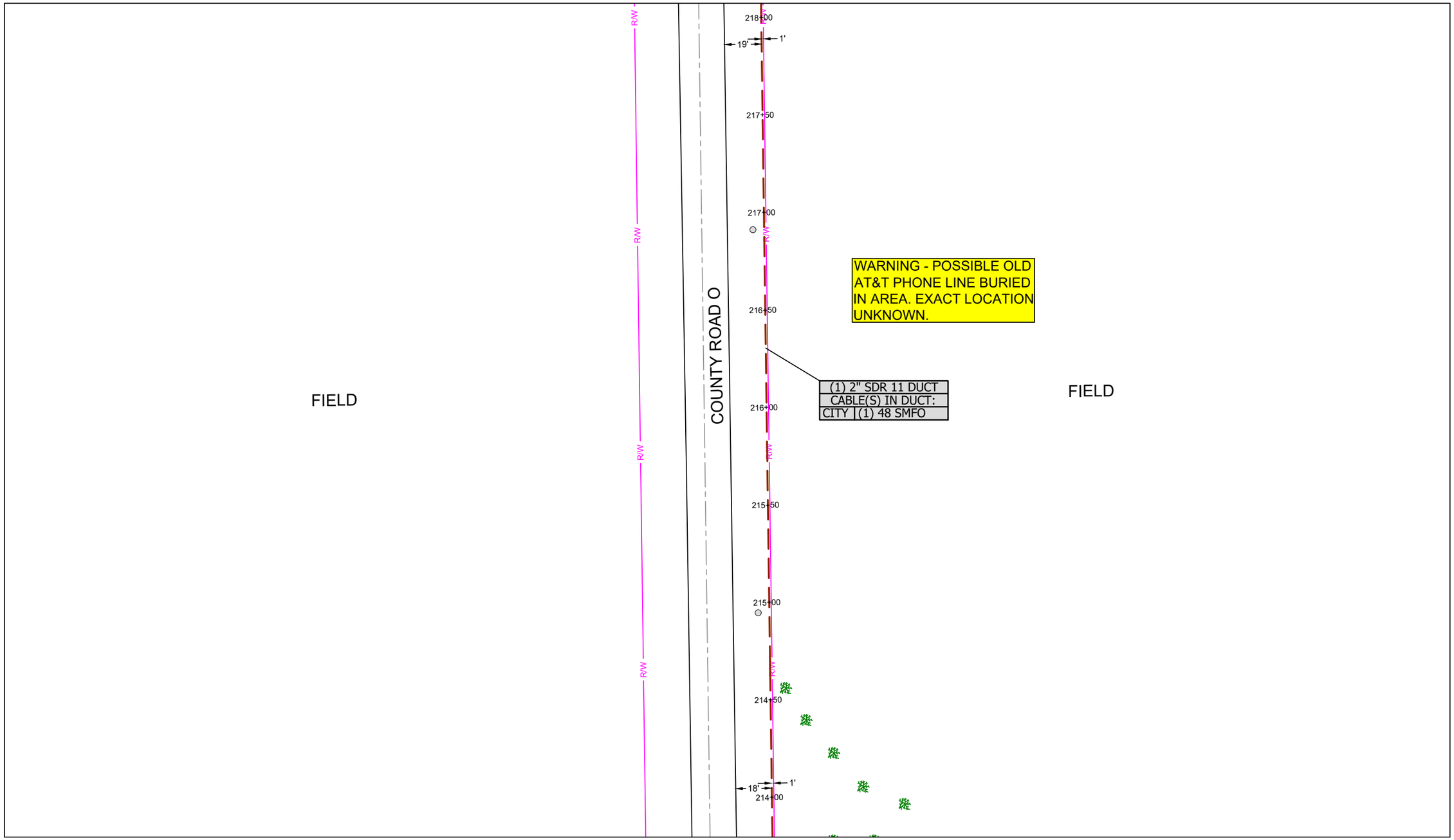
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 37

Permits required on this sheet:

See Sheet 39



See Sheet 37

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

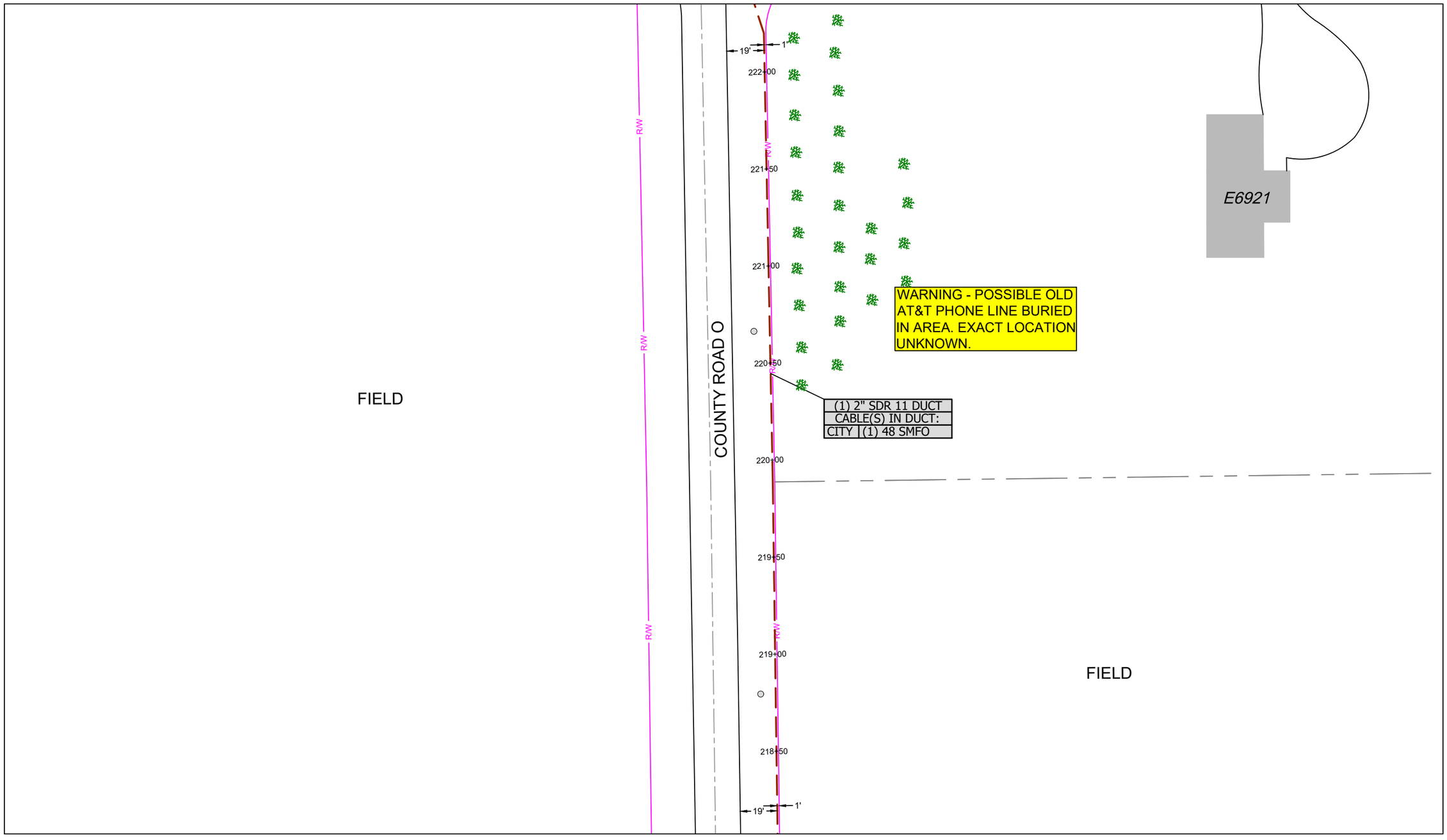
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
38

Permits required on this sheet:

See Sheet 40



See Sheet 38

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

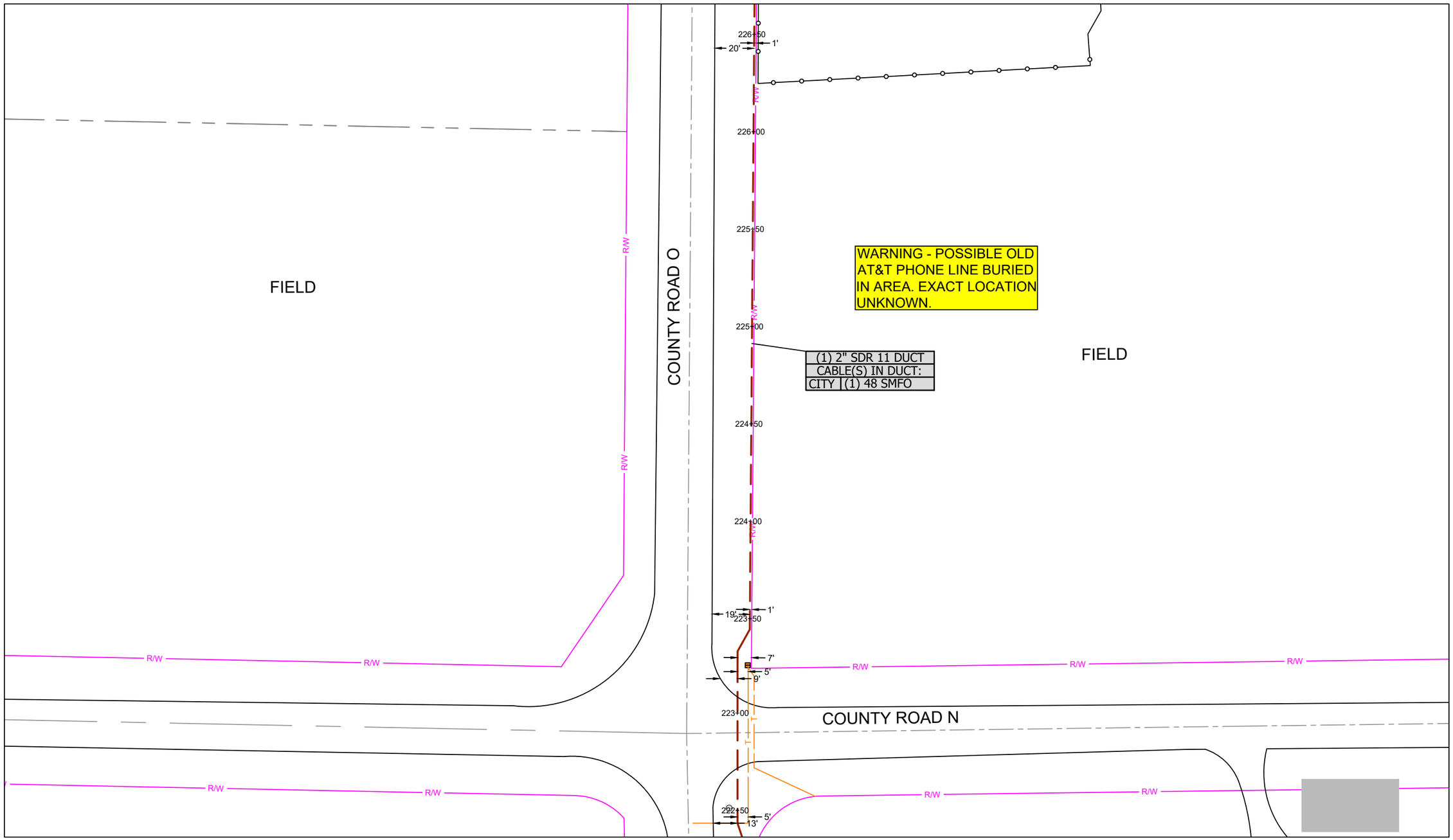
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 39

Permits required on this sheet:

See Sheet 41



See Sheet 39

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

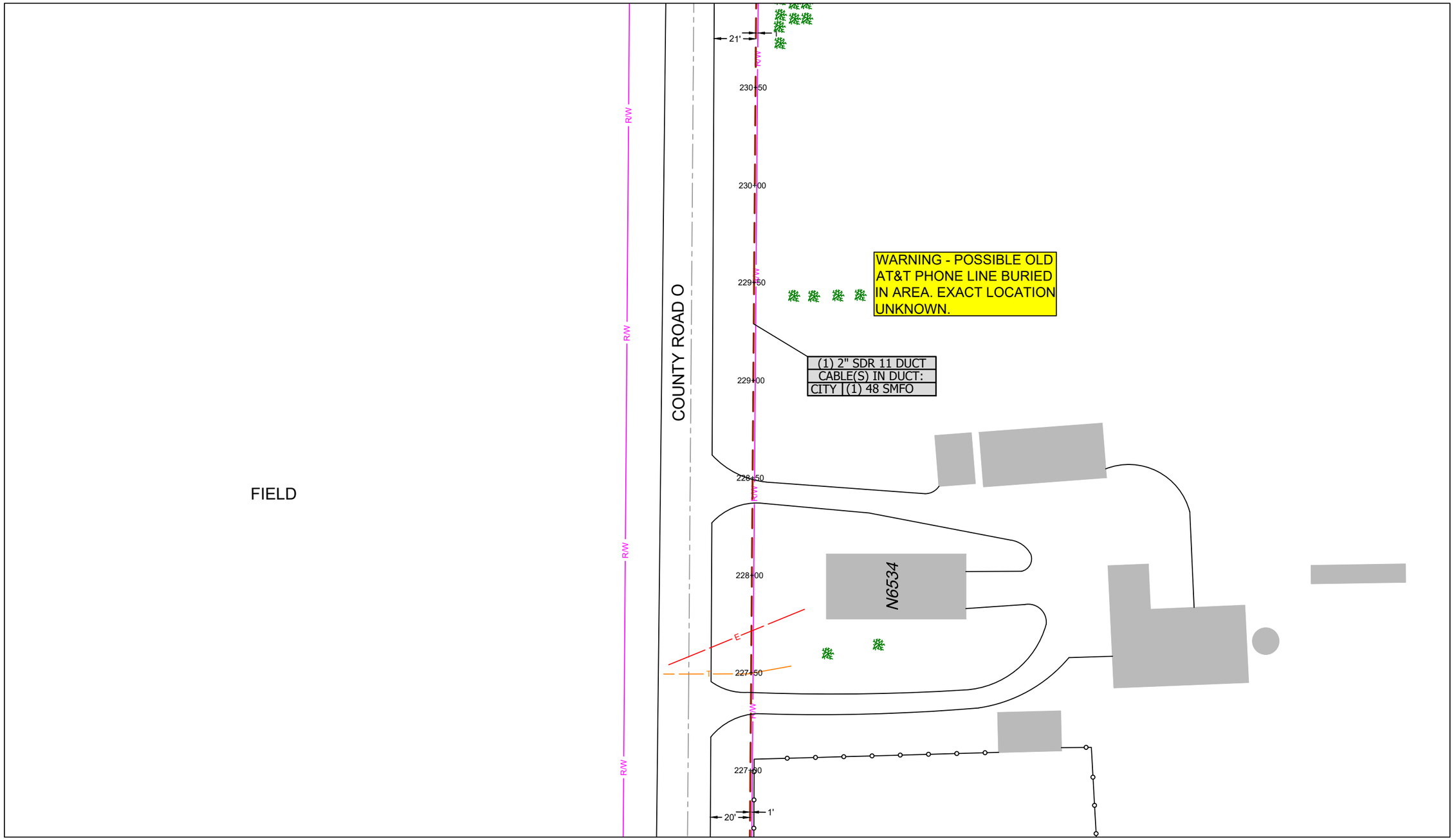
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 40

Permits required on this sheet:

See Sheet 42



See Sheet 40

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

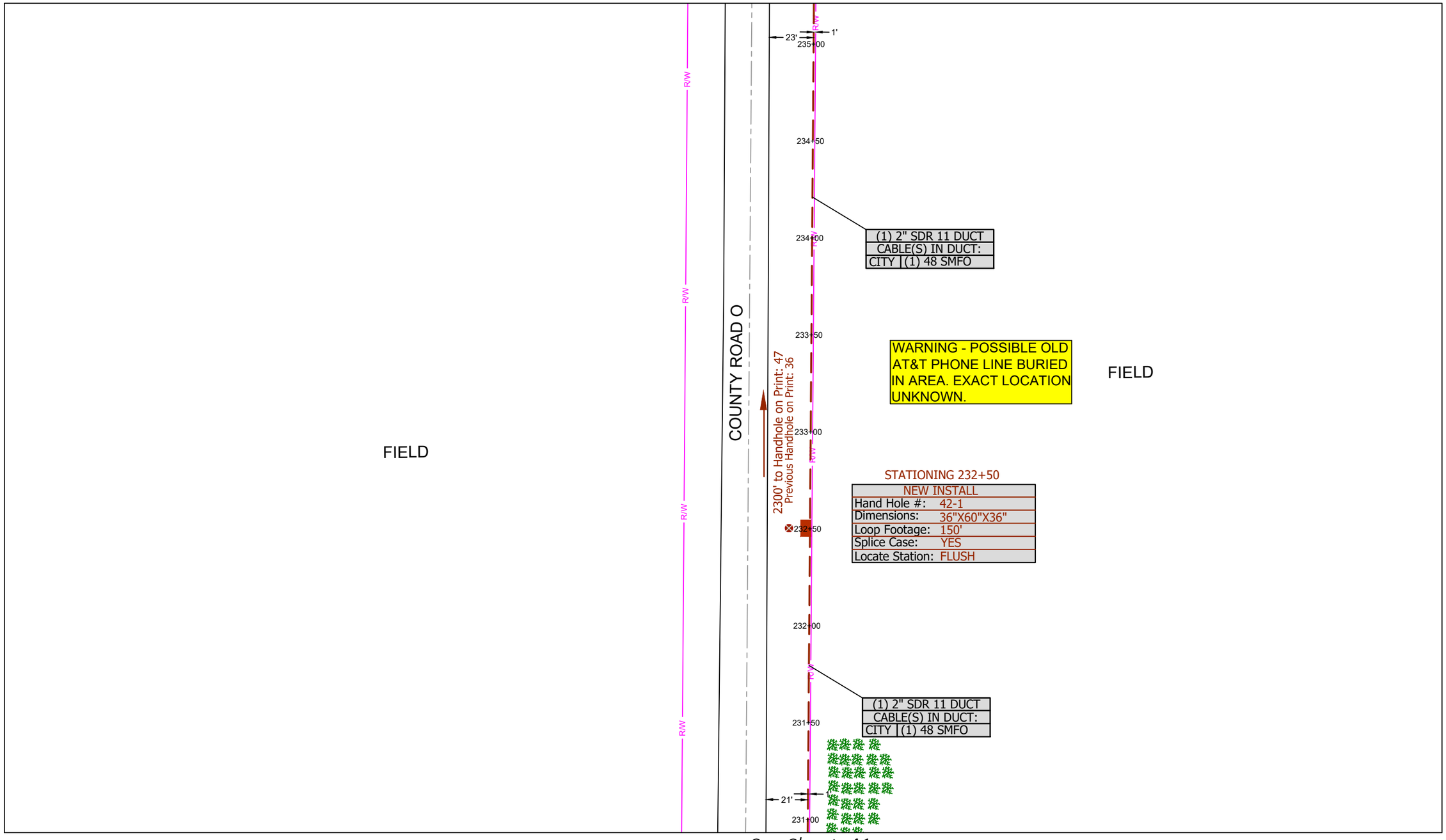
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
41

Permits required on this sheet:

See Sheet 43



See Sheet 41

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

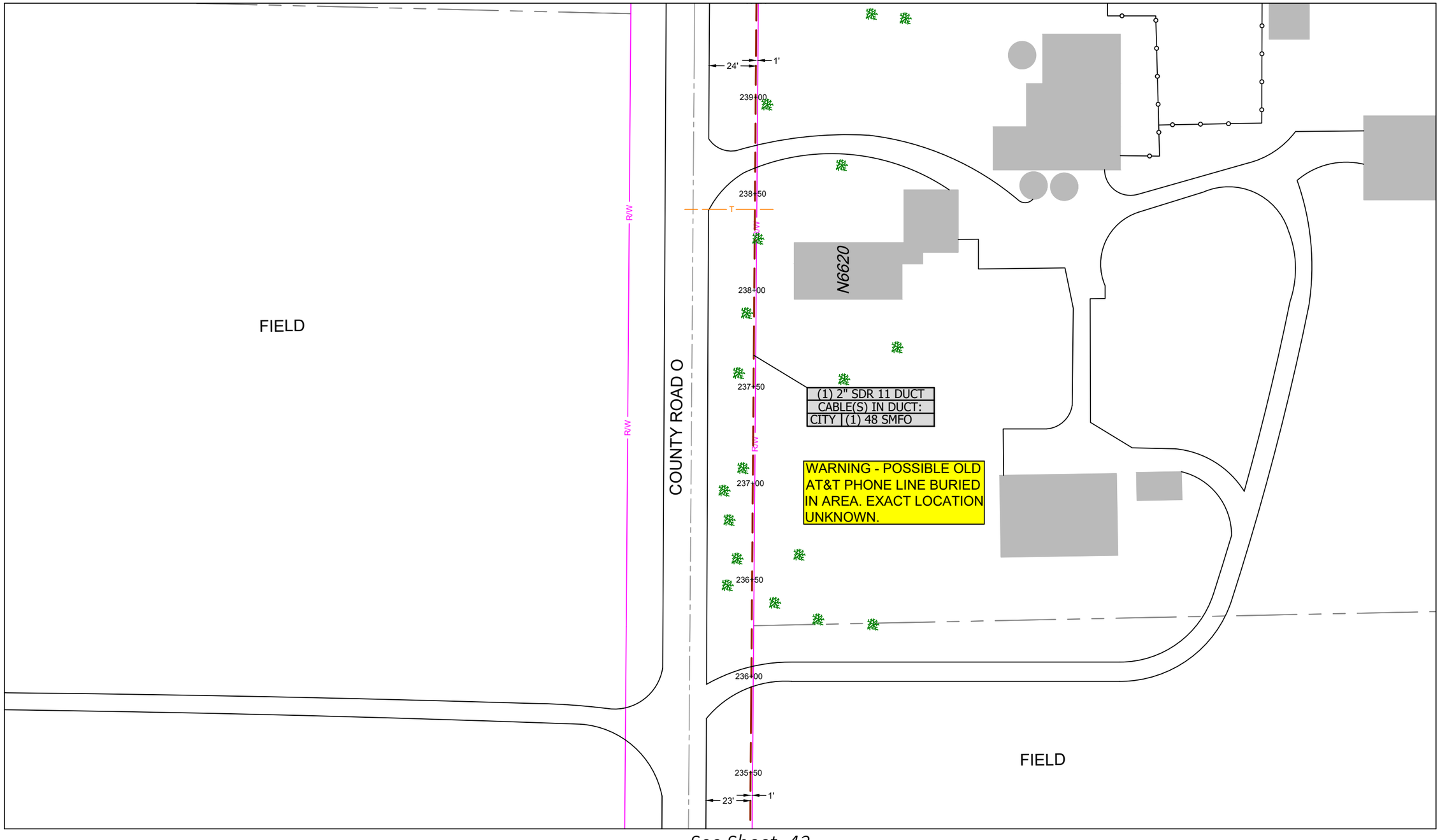
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 42

Permits required on this sheet:

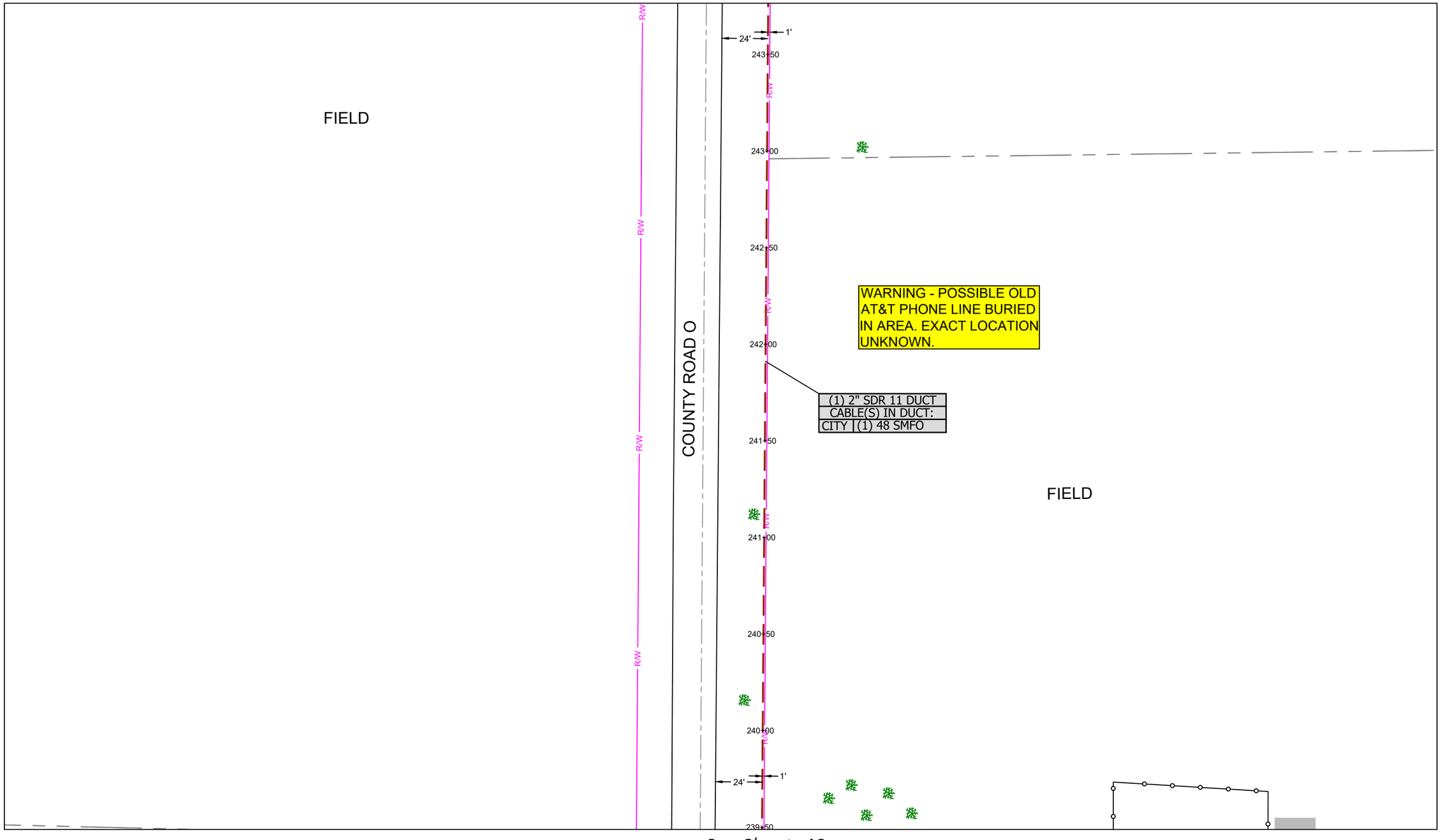
See Sheet 44



See Sheet 42

Permits required on this sheet:

See Sheet 45



See Sheet 43

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

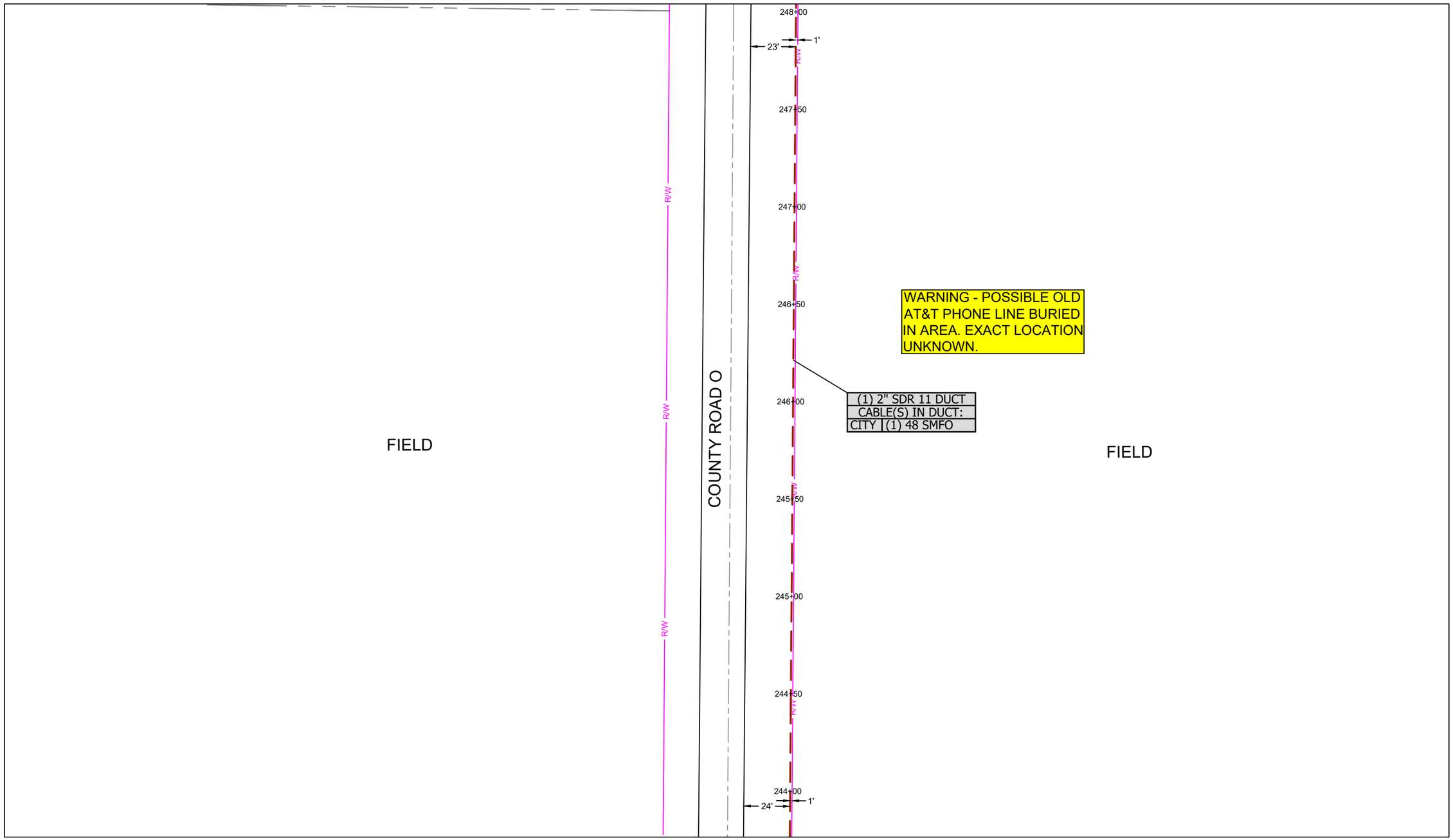
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
44

Permits required on this sheet:

See Sheet 46



See Sheet 44

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

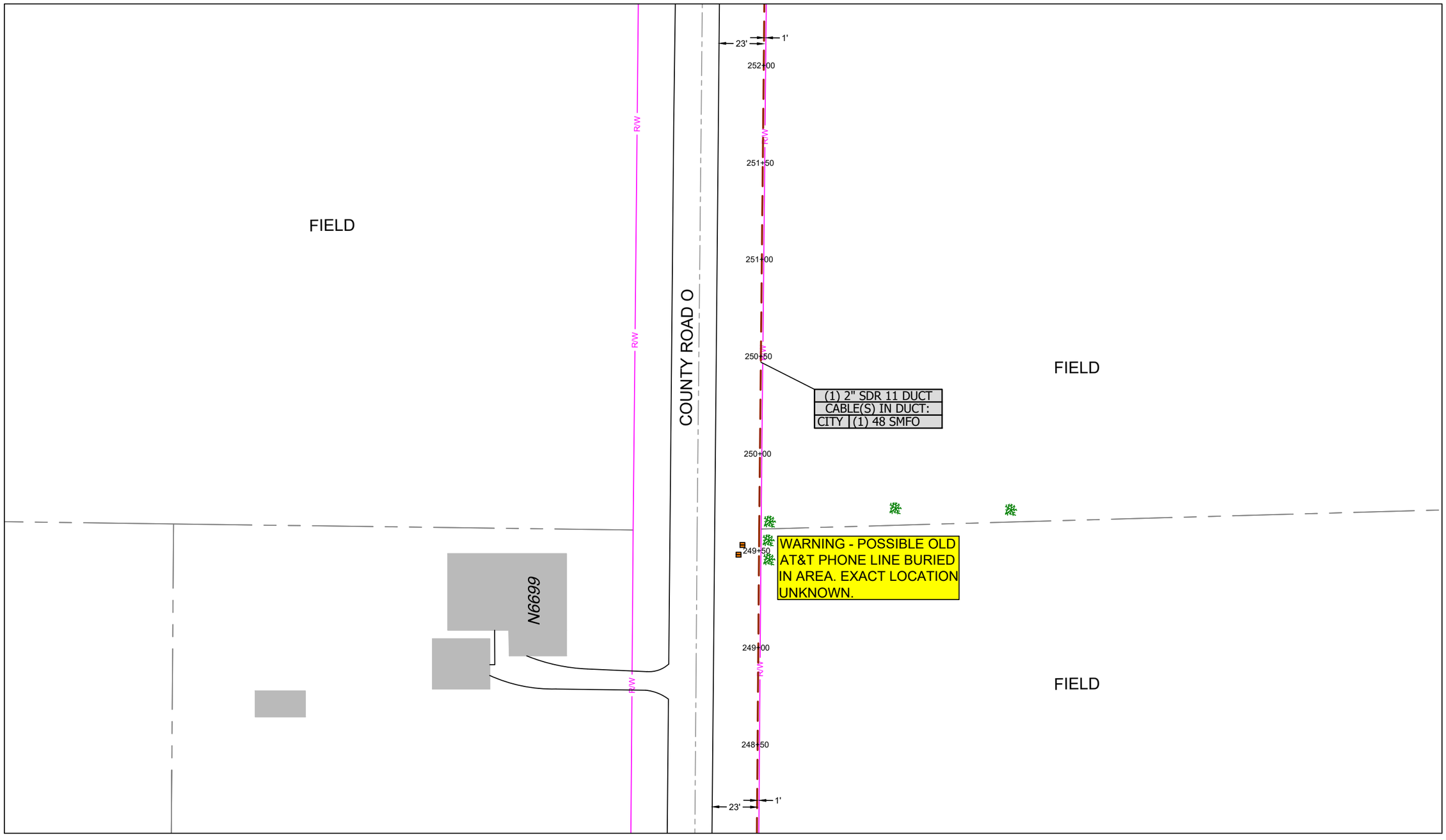
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 45

Permits required on this sheet:

See Sheet 47



See Sheet 45

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

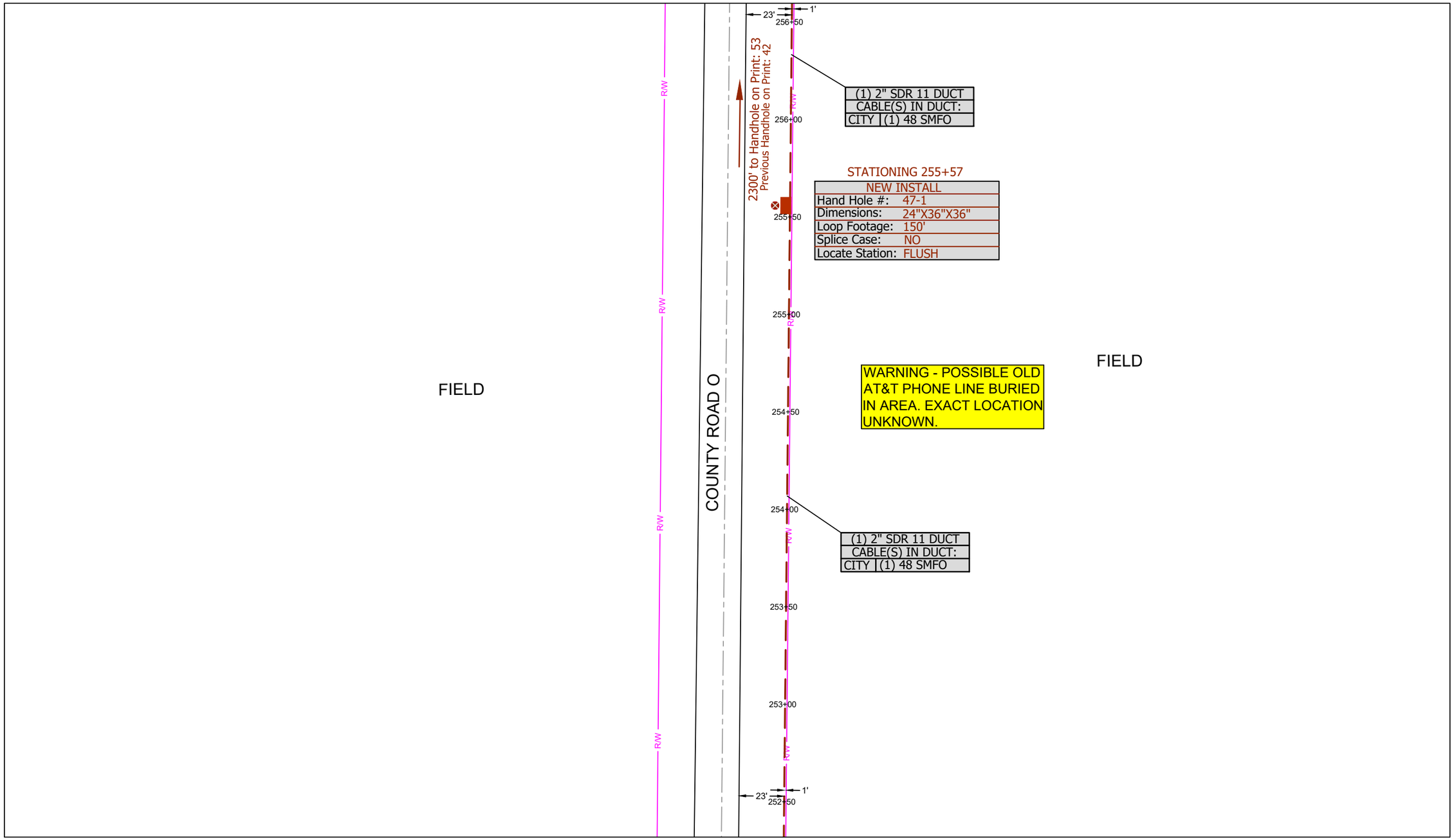
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 46

Permits required on this sheet:

See Sheet 48



See Sheet 46

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

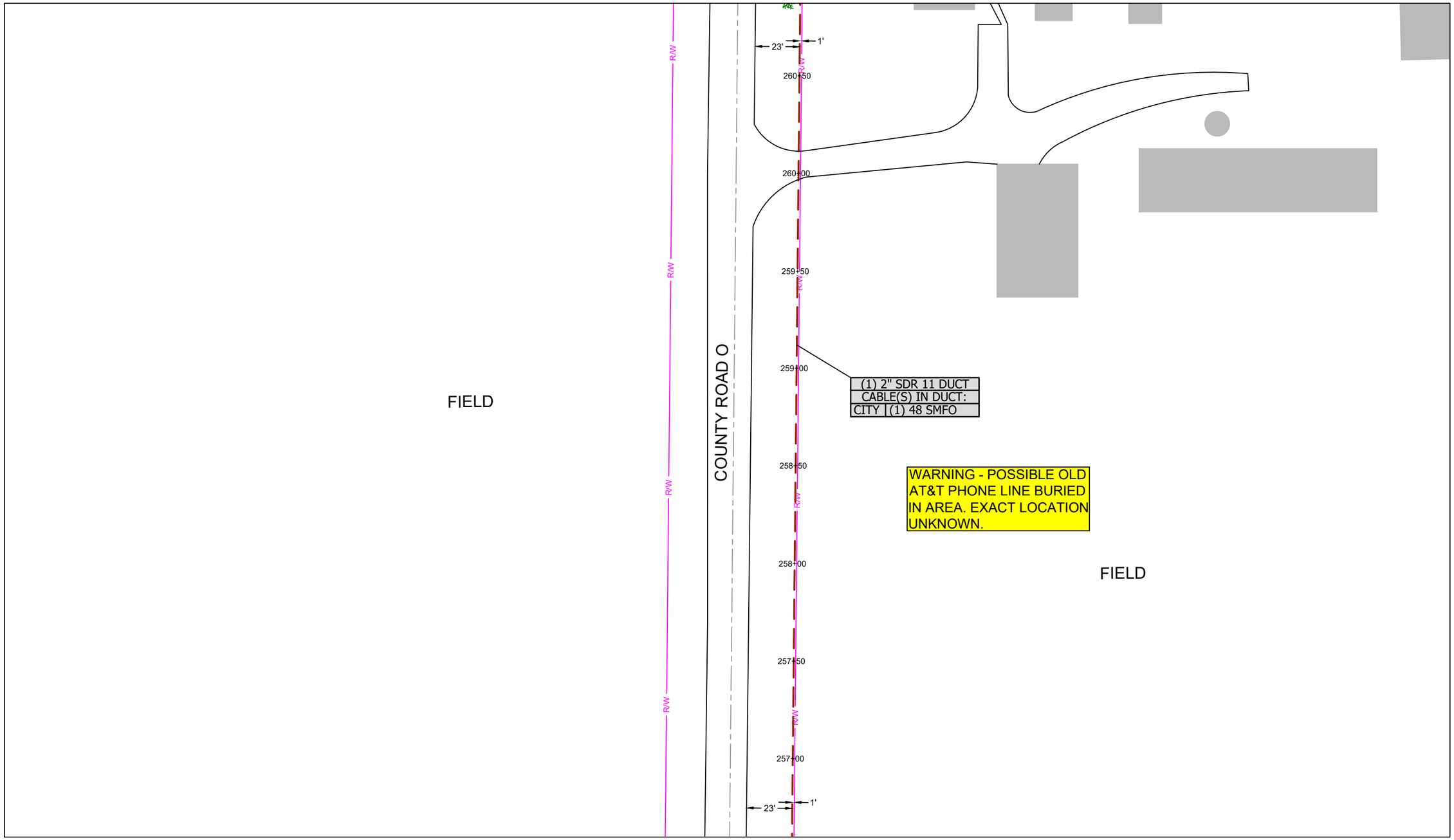
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 47

Permits required on this sheet:

See Sheet 49



See Sheet 47

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

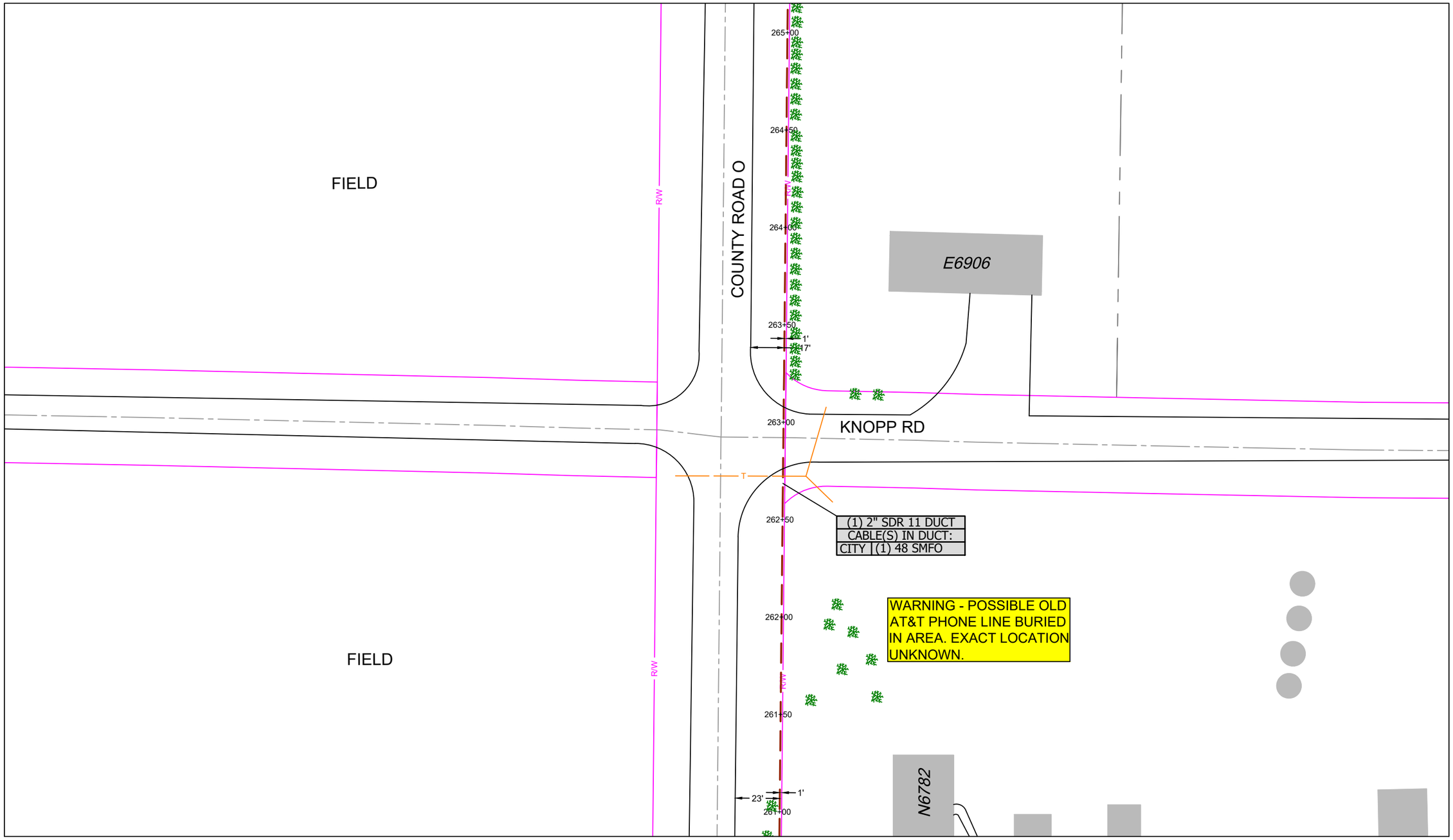
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 48

Permits required on this sheet:

See Sheet 50



See Sheet 48

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

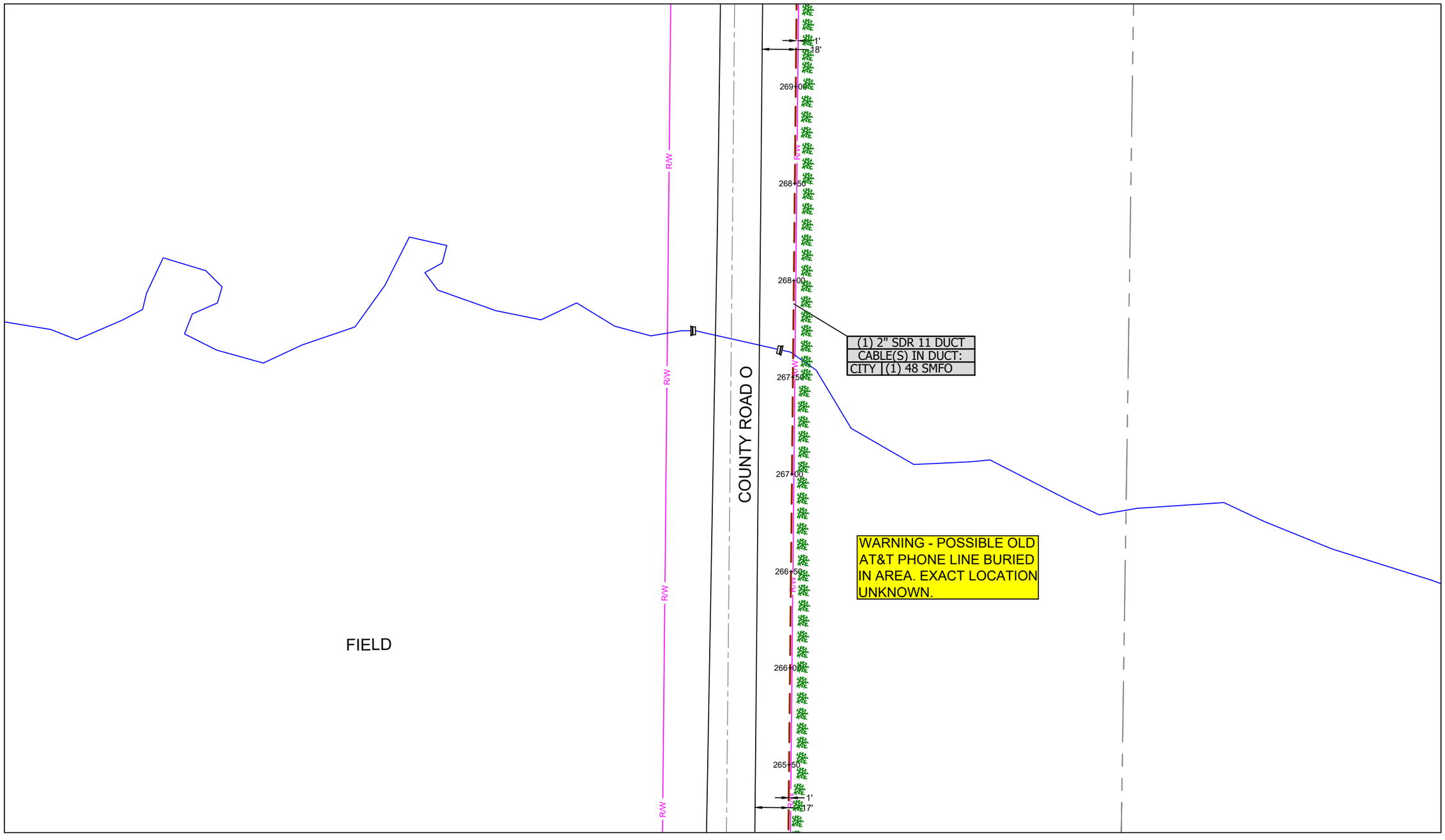
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 49

Permits required on this sheet:

See Sheet 51



See Sheet 49

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

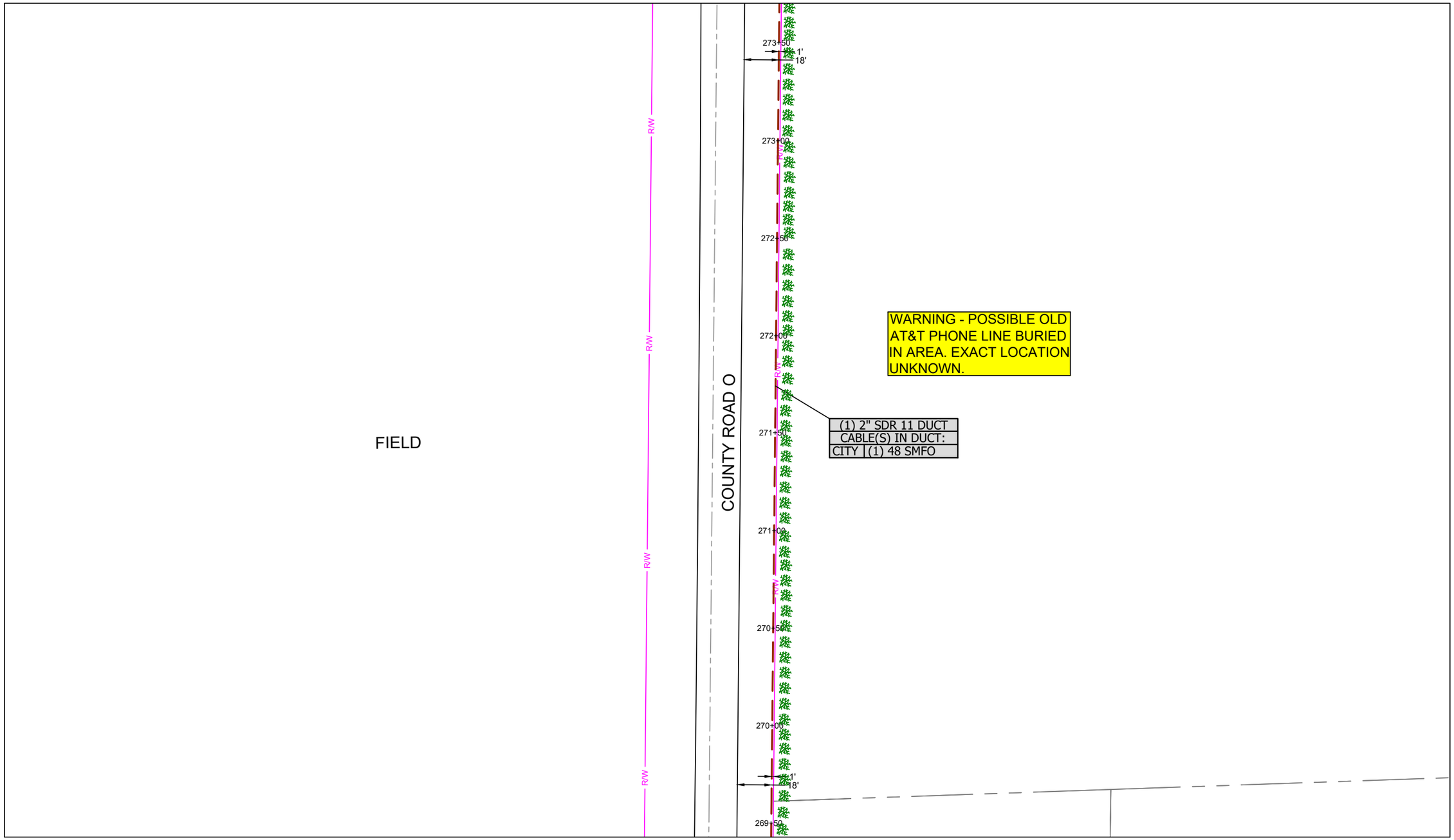
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 50

Permits required on this sheet:

See Sheet 52



See Sheet 50

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

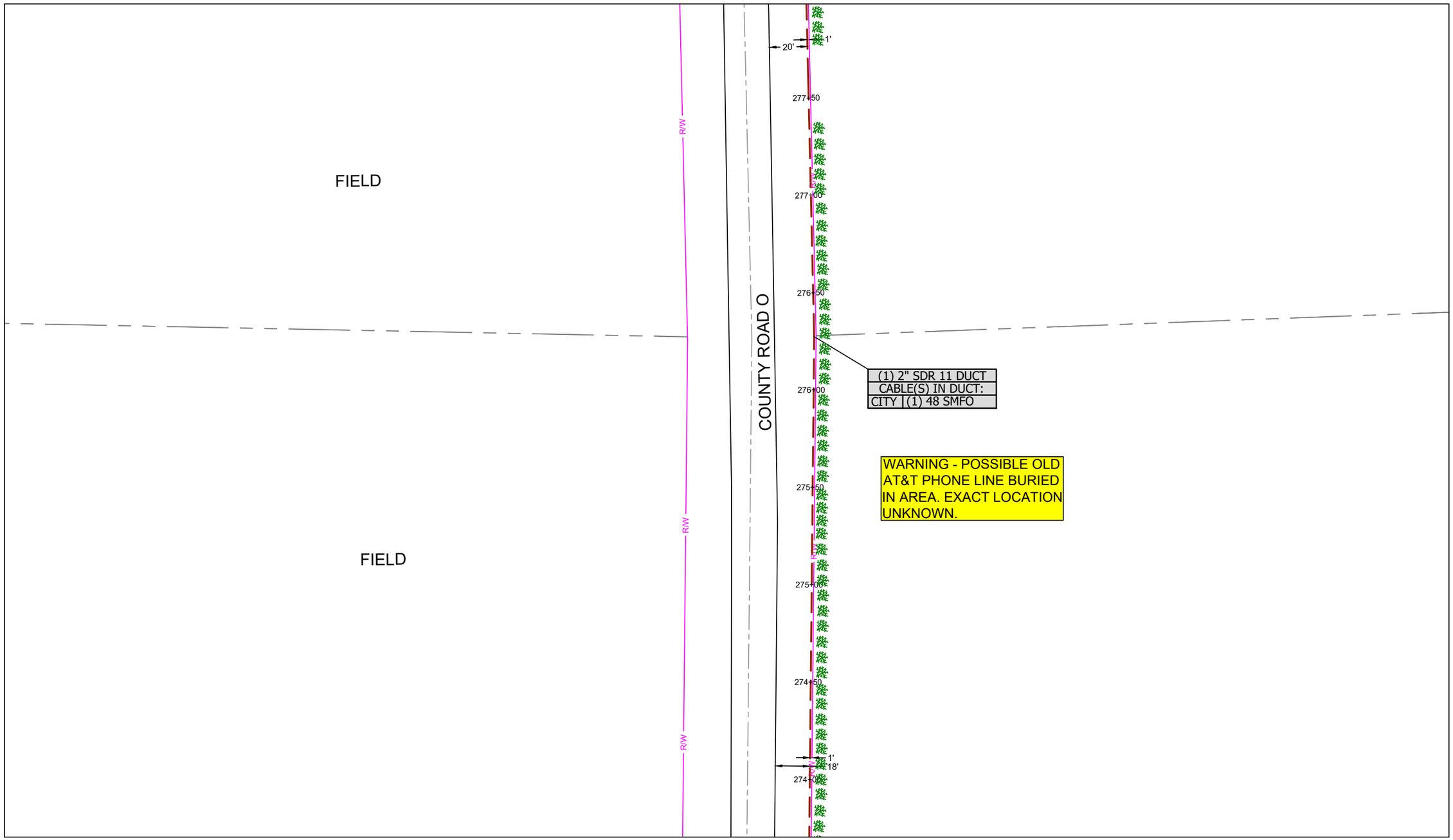
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 51

Permits required on this sheet:

See Sheet 53



See Sheet 51

Multimedia Communications & Engineering, Inc.
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P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 52

Permits required on this sheet:

See Sheet 54

See Sheet 07

FIELD

R/W

COUNTY ROAD O

19'

1'

282+00

281+50

281+00

280+50

280+00

279+50

279+00

278+50

278+00

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

WARNING - POSSIBLE OLD AT&T PHONE LINE BURIED IN AREA. EXACT LOCATION UNKNOWN.

FIELD

2183' to Handhole on Print: 58
Previous Handhole on Print: 47

STATIONING 278+61

NEW INSTALL	
Hand Hole #:	53-1
Dimensions:	24"X36"X36"
Loop Footage:	150'
Splice Case:	NO
Locate Station:	FLUSH

(1) 2" SDR 11 DUCT
CABLE(S) IN DUCT:
CITY | (1) 48 SMFO

See Sheet 52

Multimedia Communications & Engineering, Inc.
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0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

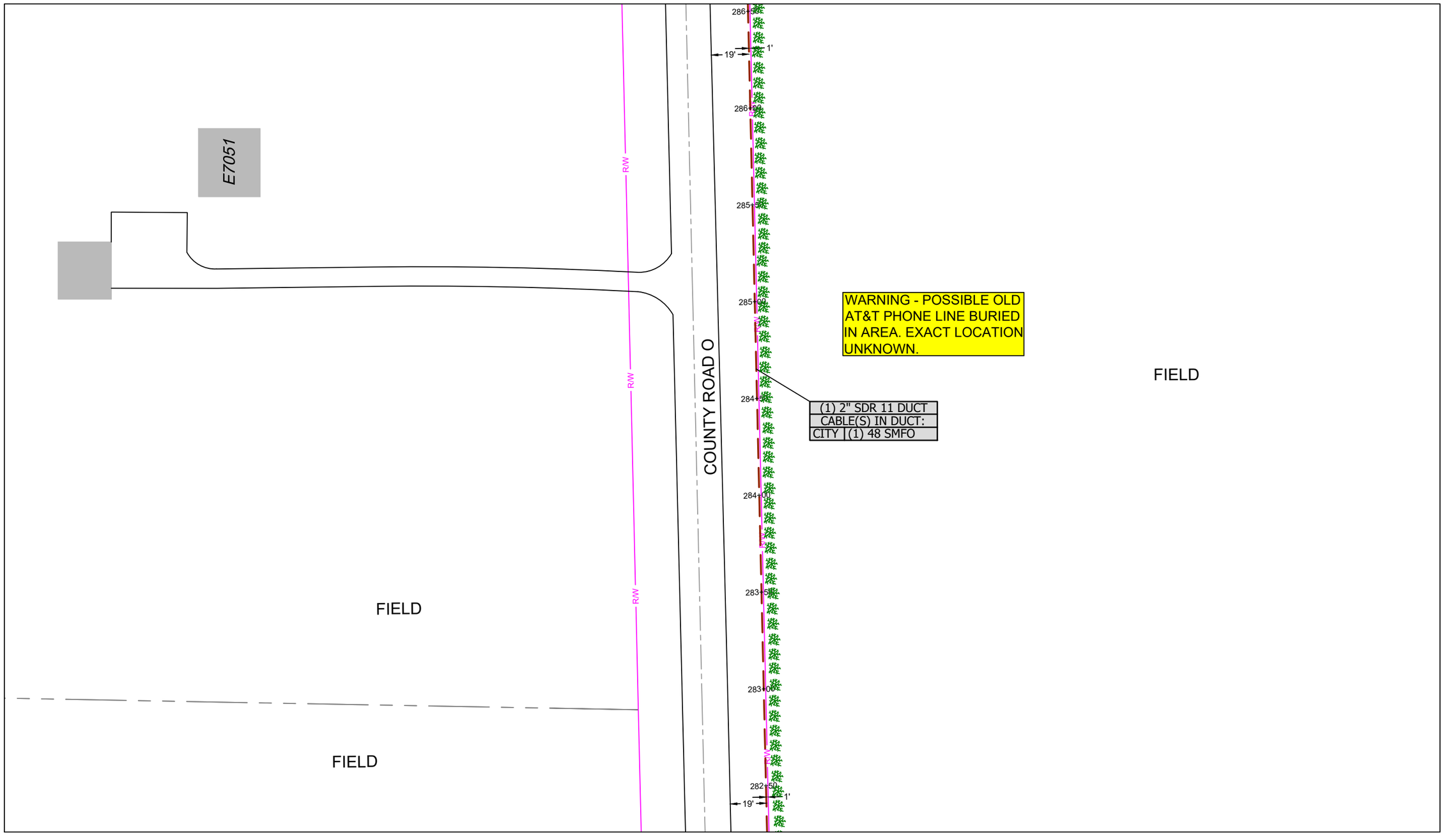
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 53

Permits required on this sheet:

See Sheet 55



See Sheet 53

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

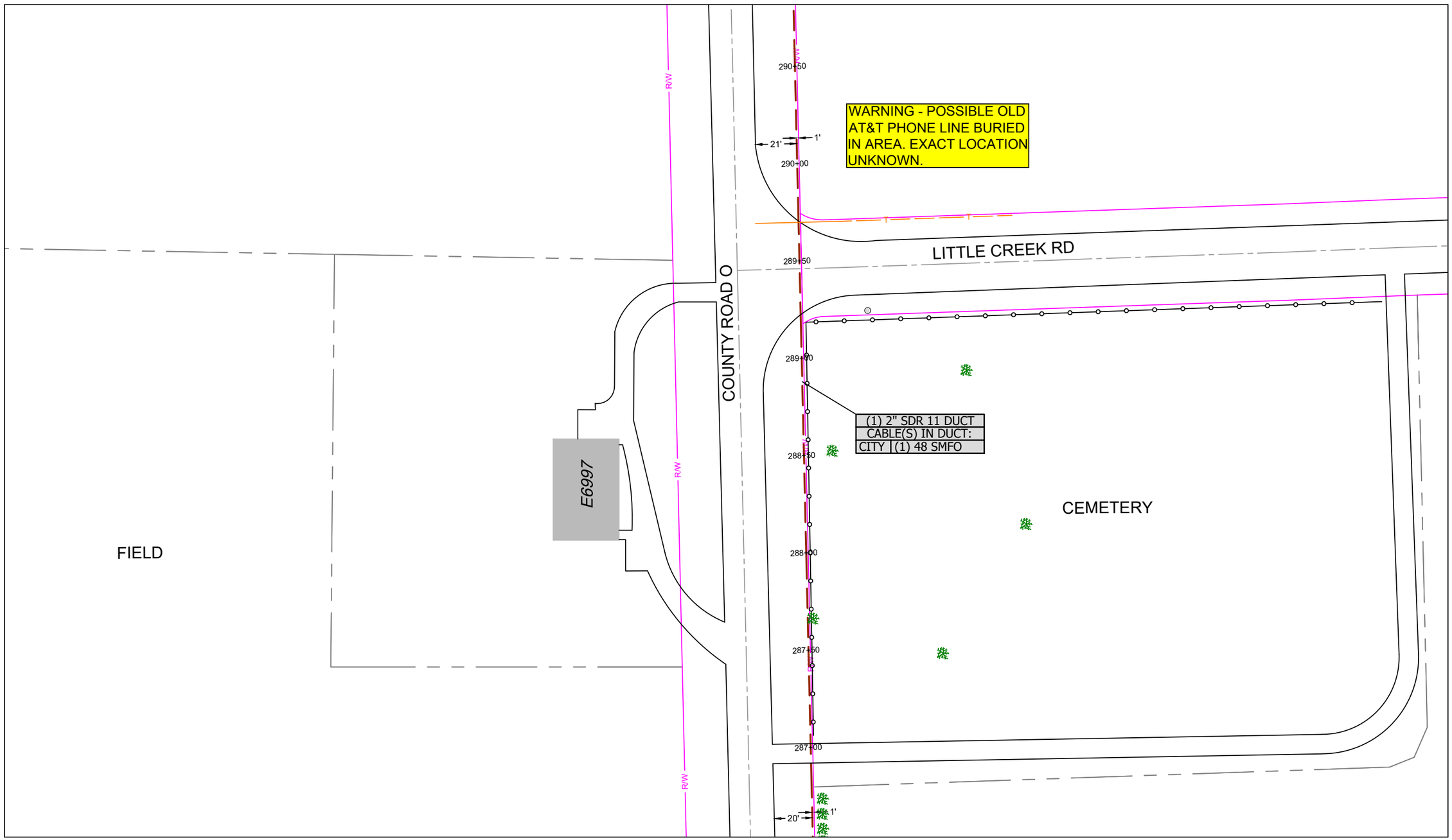
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 54

Permits required on this sheet:

See Sheet 56



See Sheet 54

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

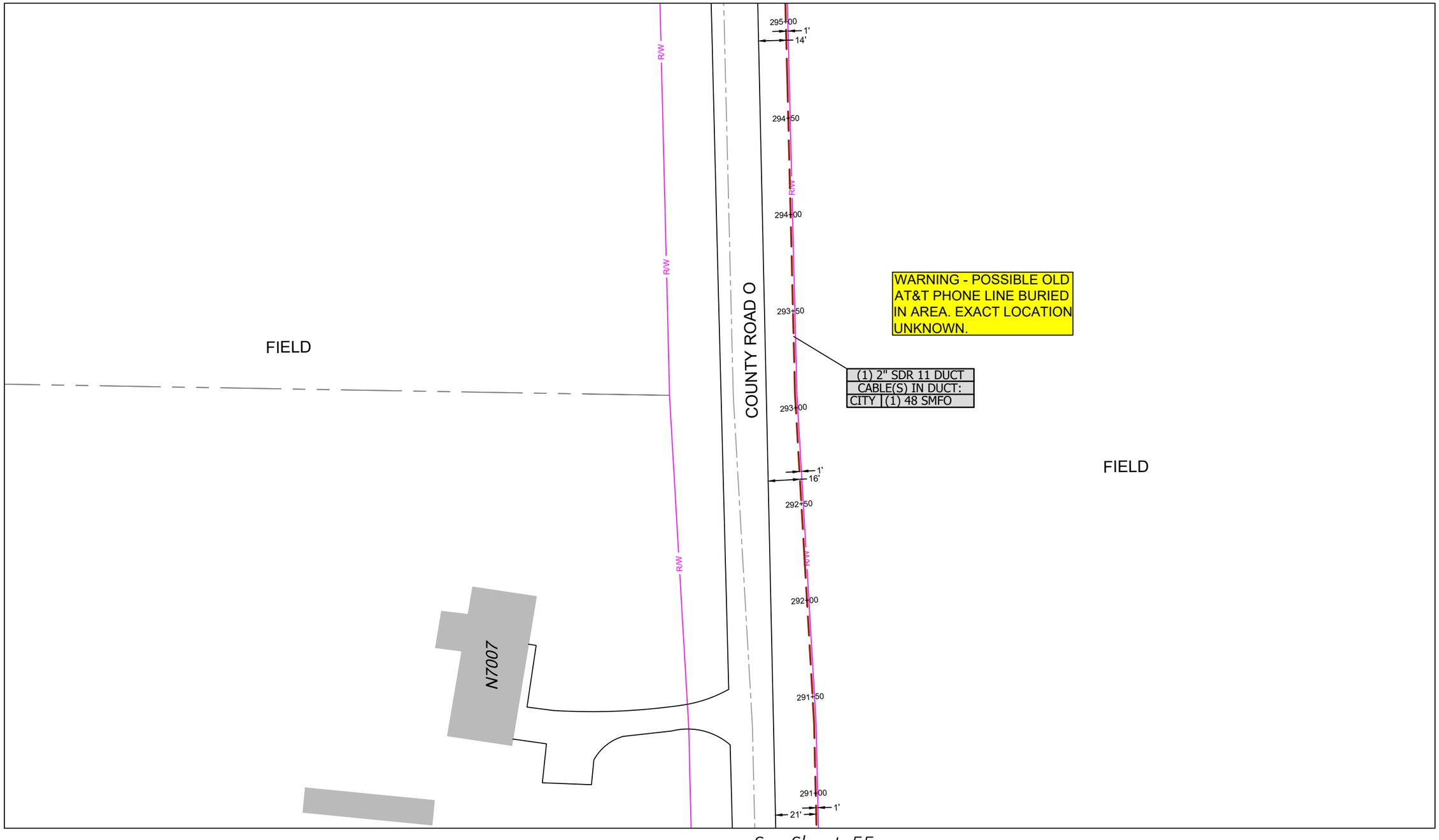
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 55

Permits required on this sheet:

See Sheet 57



See Sheet 55

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

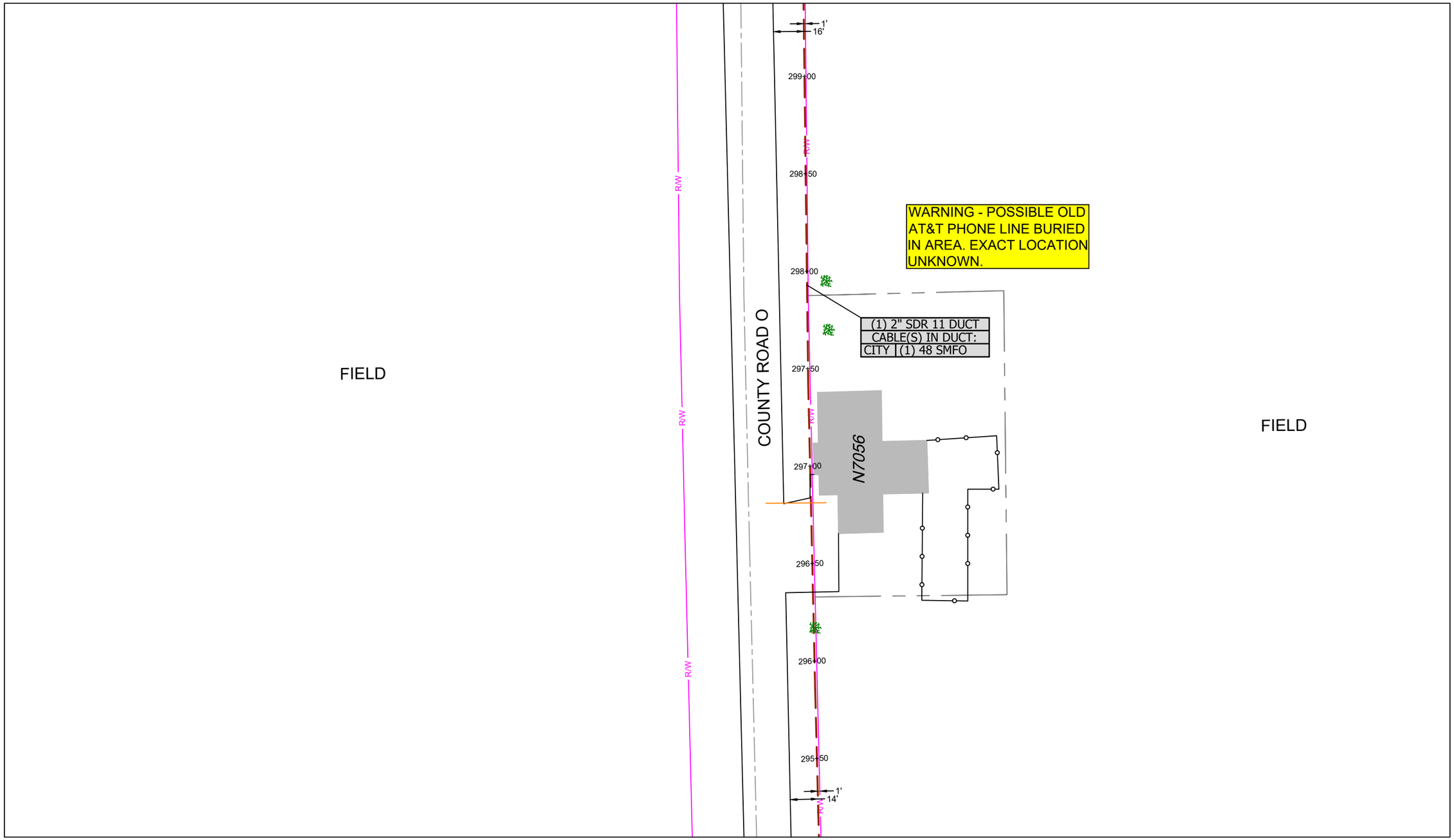
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
56

Permits required on this sheet:

See Sheet 58



See Sheet 56

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

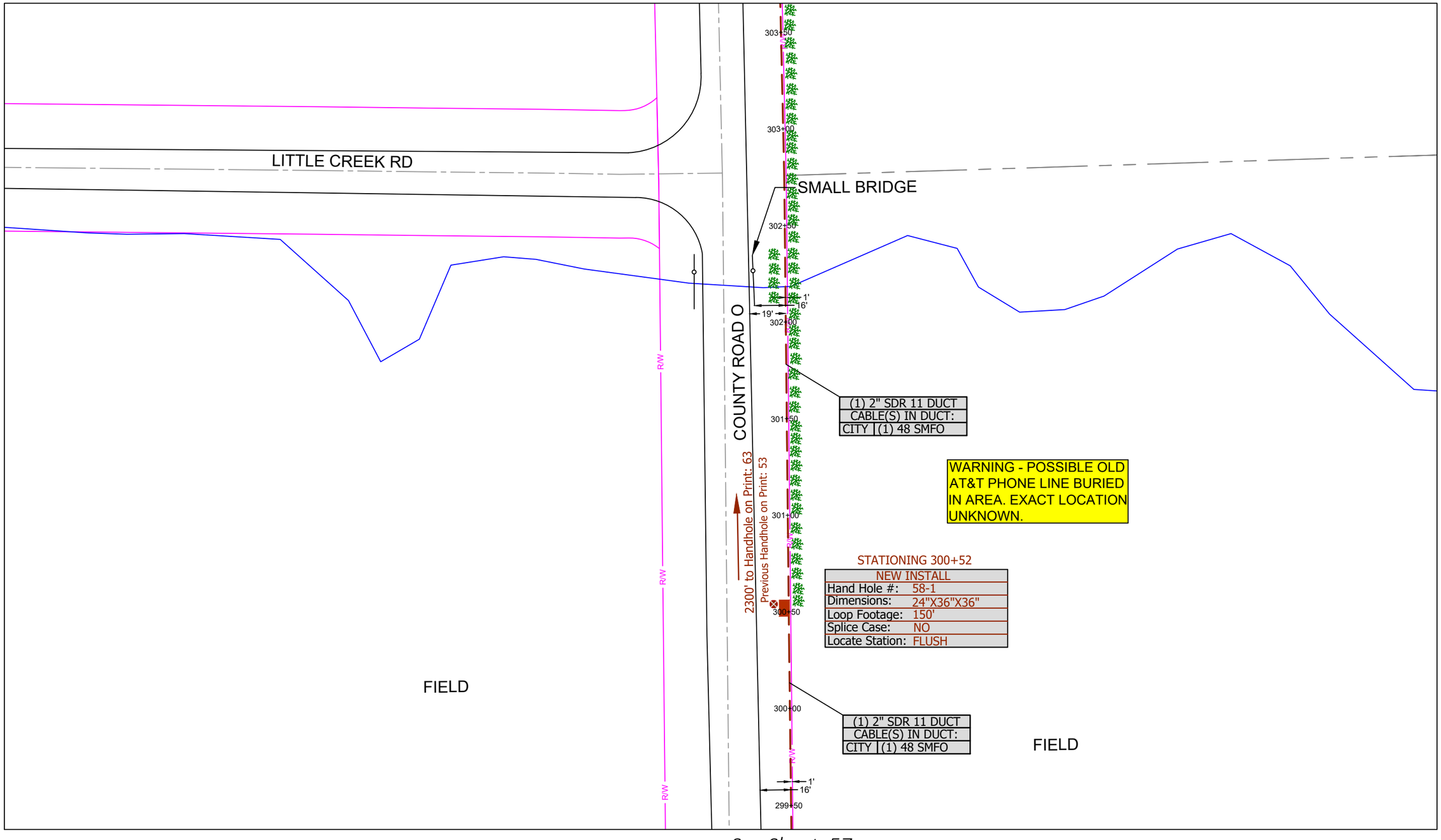
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 57

Permits required on this sheet:

See Sheet 59



See Sheet 57

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

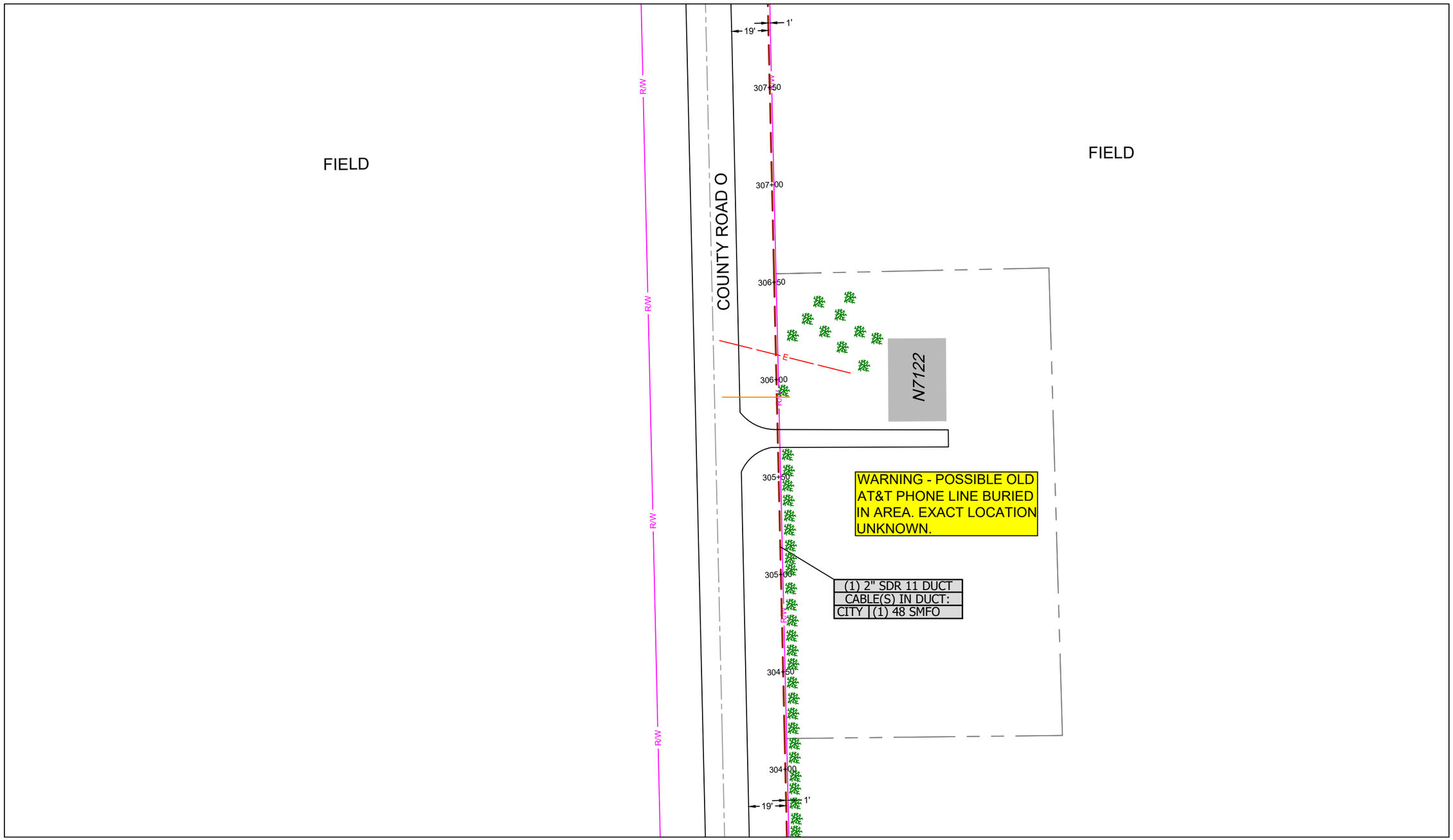
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 58

Permits required on this sheet:

See Sheet 60



See Sheet 58

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

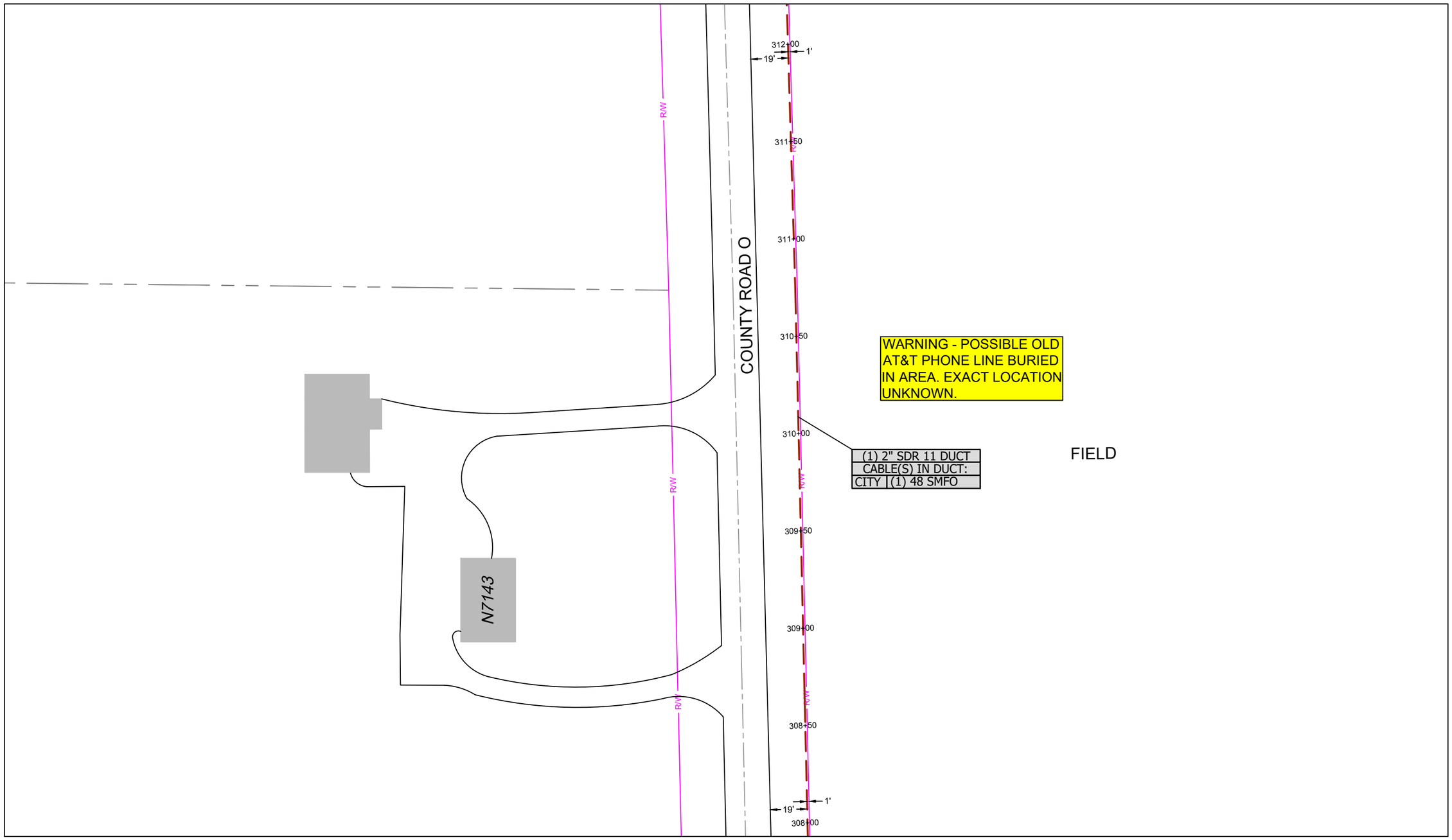
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 59

Permits required on this sheet:

See Sheet 61



See Sheet 59

Multimedia Communications & Engineering, Inc.
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P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

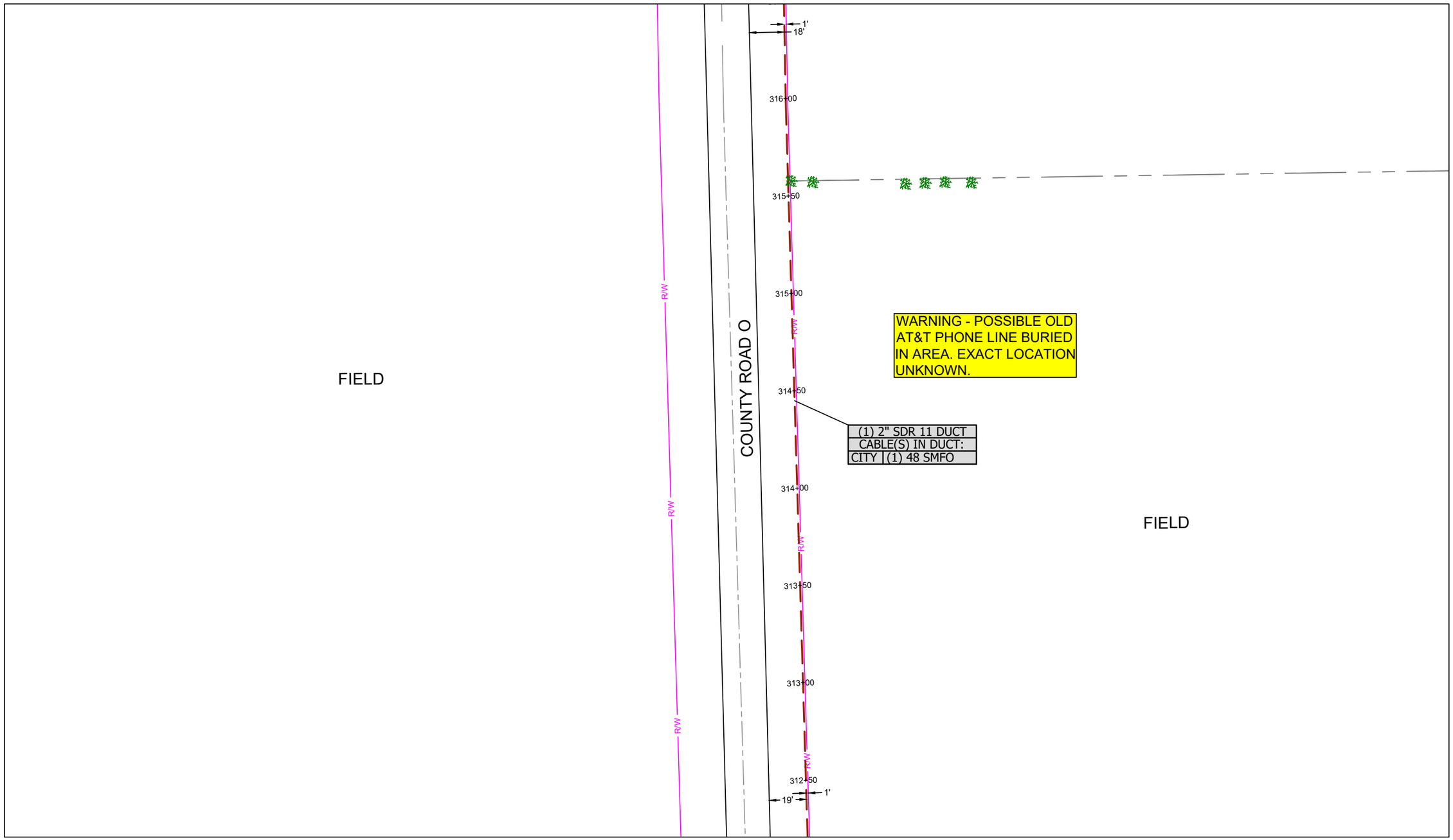
SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
1:50 Scaled Plans

Sheet ID:
60

Permits required on this sheet:

See Sheet 62



See Sheet 60

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

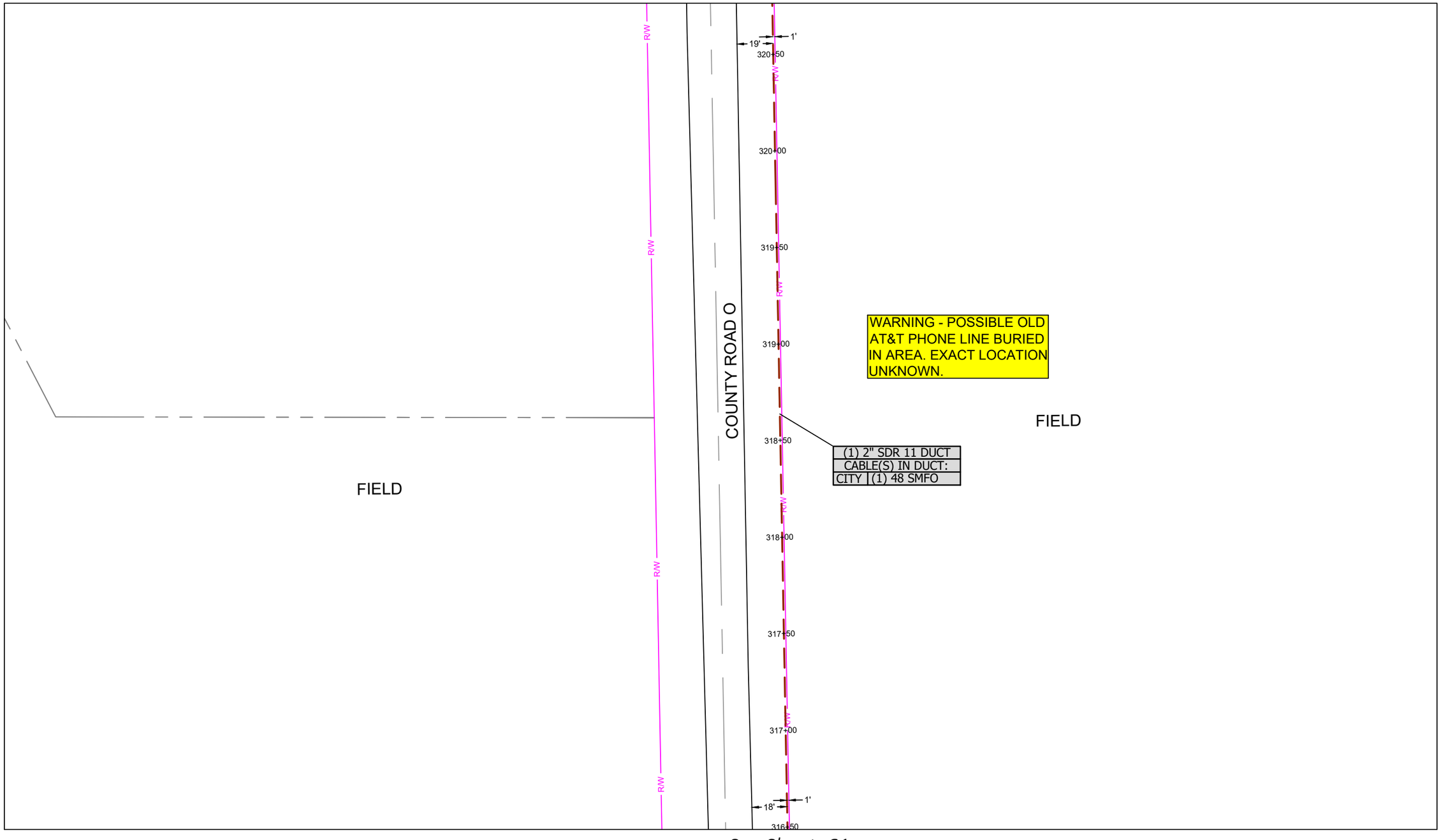
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 61

Permits required on this sheet:

See Sheet 63



See Sheet 61

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

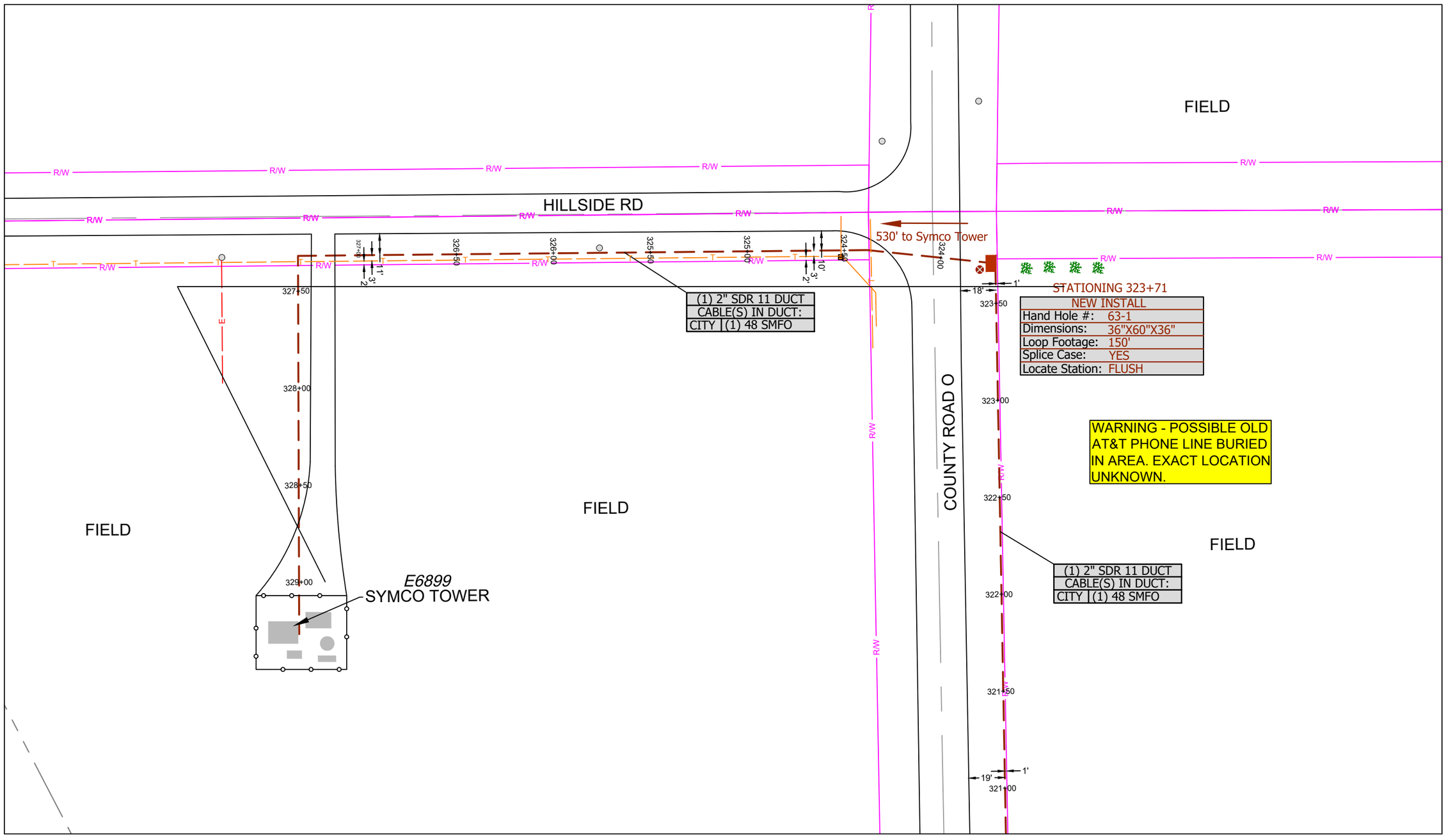
Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 62

Permits required on this sheet:



See Sheet 62

Multimedia Communications & Engineering, Inc.
PO Box 11064 Green Bay, WI 54307
P: 920.393.3492 I 877.870.6968

0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

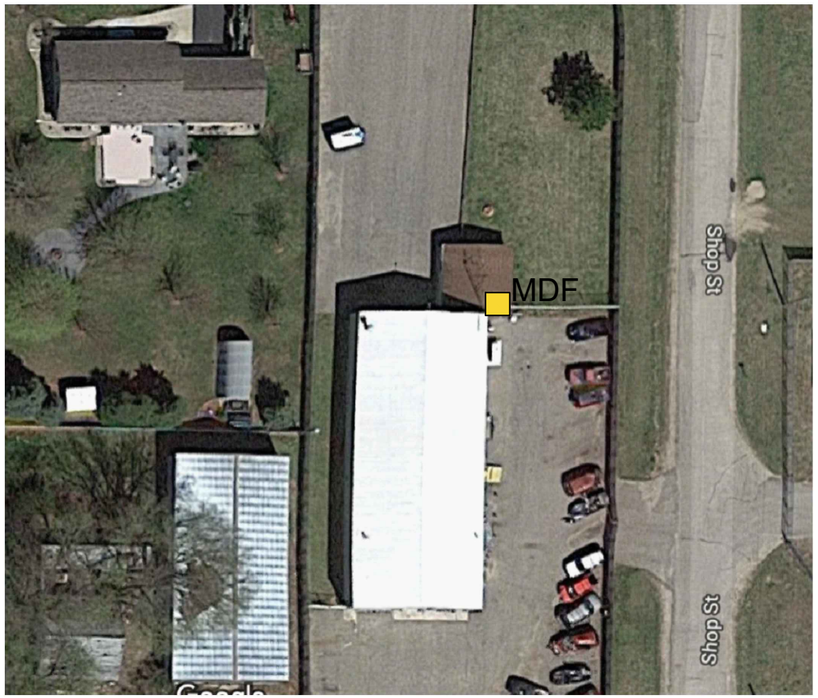
SYMCO TOWER CONNECT
06/05/2018

Sheet Group: 1:50 Scaled Plans

Sheet ID: 63

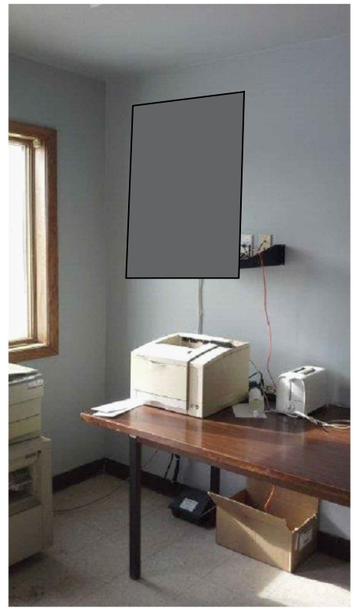
Permits required on this sheet:

MDF LOCATION



EXISTING BUILDING ENTRY BOX

EXISTING RACK LOCATION



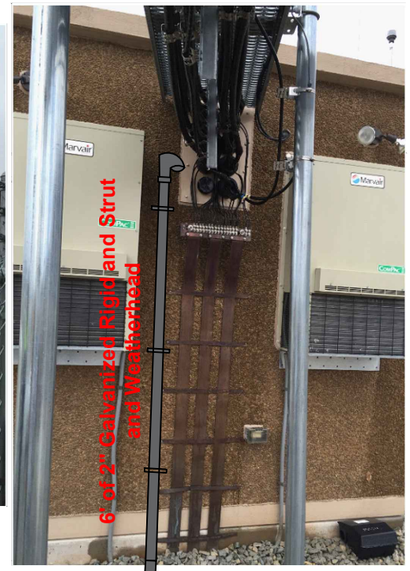
6

Permits required on this sheet:

MDF LOCATION

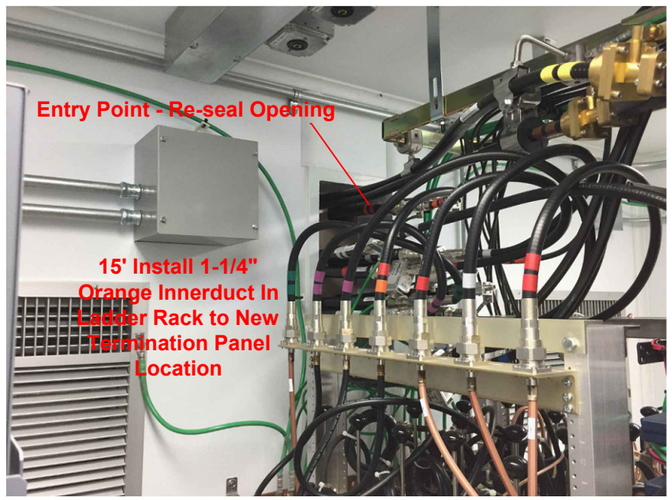
OUTSIDE PICTURE

NEW BUILDING ENTRY WEATHERHEAD



OUTSIDE PICTURE

INSIDE ENTRY LOCATION



RACK LOCATION

NEW PANEL INSTALLATION

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0 50' 100' N

Scale: 1" = 50' ANSI B/Tabloid

SYMCO TOWER CONNECT
06/05/2018

Sheet Group:
INSIDE PLANSET

Sheet ID:
ISP-2

Permits required on this sheet: