

# How to Prepare for an AC Mitigation Installation Project

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THE GREATEST ASSET  
OF A COMPANY IS  
ITS PEOPLE



# What we are going to cover

- Understanding the Modeling Report
- Project/RFQ Development
- Vendor Selection
- Material Management
- Inspecting the Installation process
- Execution
- Final Paperwork

# Review of Modeling Report

## Table of Contents

Skip to section E.

- What is going to be installed and where?

1. Install the recommended 5,965 feet of stranded 2/0 bare copper ribbon.
2. Install the 3 recommended pedestal mounted 10kA PCRs with isolation switches.
3. Install the 6 recommended CTSs and RMUs.
  - a. Program RMUs to take readings every half hour.
4. Install a high resistance crushed stone around the 10 identified above grade appurtenances.
5. Install appurtenance barricades around the 6 identified above grade appurtenances.
  - a. A total of 3 barricades with 6-foot by 6-foot dimensions.
  - b. A total of 3 barricades with 2-foot by 2-foot dimensions.
6. Update the 4 existing test stations to a “dead-front” style test station.
7. At least 60 days after installation, perform a test station survey or an AC CIS to determine the effectiveness of the applied mitigation.

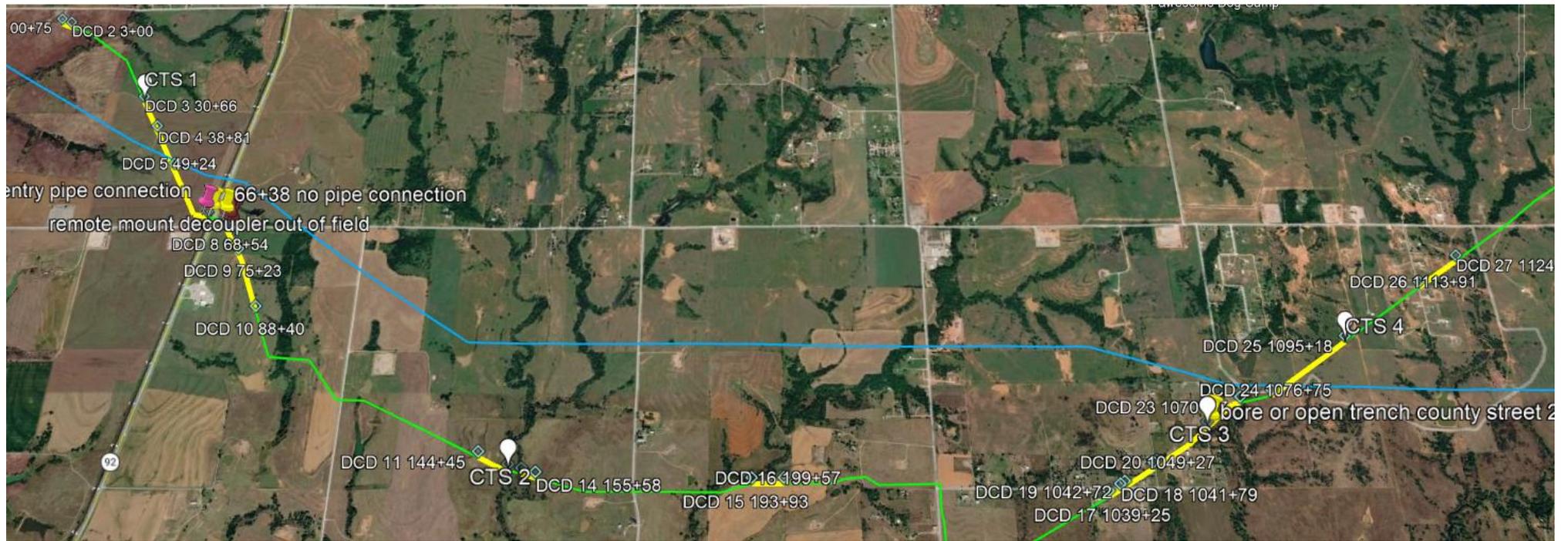
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TABLE 4 –	██ Farm project soil resistivity testing locations
TABLE 5 – 7 –	██ Farm pipeline software modeling results
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**INSTALLATION LOCATIONS AND MATERIALS**

SECTION NAME	STATION NO. START	STATION NO. END	SECTION LENGTH (FT)	START LAT.	START LON.	END LAT.	END LON.	NUMBER OF DECOUPLERS	NUMBER OF METRICORR ER PROBES	#6 AWG COPPER CABLE PCRX TO PIPELINE (FT)	#6 AWG COPPER CABLE TO PIPELINE EXOTHERMIC WELD CONNECTIONS
11107-05	307+03	318+23	1120	41.466970	-88.261913	41.469642	-88.259866	2	0	200	4
11107-06	357+19	411+90	5470	41.478944	-88.252704	41.491905	-88.242721	6	1	600	12
11107-07	413+05	446+35	3330	41.492186	-88.242506	41.500066	-88.236450	4	1	400	8
11314-01	228+00	244+90	1690	41.411642	-88.261269	41.407023	-88.261067	3	0	300	6
11314-02	245+50	270+60	2510	41.406860	-88.261059	41.404571	-88.255094	4	1	400	8
11316-01	270+00	288+10	1810	41.404615	-88.254887	41.404724	-88.248257	3	1	300	6
<b>TOTAL:</b>			<b>15930</b>					<b>22</b>	<b>4</b>	<b>2200</b>	<b>44</b>

ITEM NO.	ESTIMATED MATERIALS LIST	UNIT	QTY
<b>AC MITIGATION</b>			
1	DC DECOUPLER: Dairyland Model SSD-3/1-2.0-100-R	EA	9
2	FIBERGLASS ENCLOSURE (at SSD): Dairyland Model MTP-36	EA	9
3	BOND BOX: Fiberglass 10X10X6	EA	8
4	POST (Bond Box): 4"x4"x6' Penta Treated Pine Post	EA	8
5	TEFGEL (Terminal coating): TG 02 - 2oz Tub	EA	5
6	ISOLATION SWITCH (SSD): Dairyland SWX-100-PIED	EA	9
7	MTR-1 (SSD): Terminal Extension Bus Kit for Decouplers with Hardware	EA	2
8	ZINC RIBBON (Mitigation Cable): Extruded, 1/2" x 9/16", 0.6 lb./ft., Type II alloy conforming to ASTM B418	FT	8,200
9	TERMINAL LUG (SSD): Ring style for #2 AWG, with hole size to accommodate a 5/16" bolt	EA	24
10	TERMINAL LUG (Switch): Burndy YAV4CL245, compression ring tongue terminal for #4 AWG and a 1/2" stud	EA	24
11	TERMINAL LUG (Bond Box): Burndy KPA4C, mechanical terminal lug for #4 AWG and a 1/4" stud	EA	55
12	WARNING TAPE: 3"x 1000' Detectable Warning Tape, Red with Black lettering ("CAUTION BURIED ELECTRIC LINE BELOW")	ROLL	9
13	PVC CONDUIT (at SSD): 2" Dia Schedule 40	FT	30
14	PVC CONDUIT (at Bond Box): 2" Dia Schedule 80	FT	50
15	CIAMP: Pipe clamp for 2" pvc to post	EA	25

# KMZ File

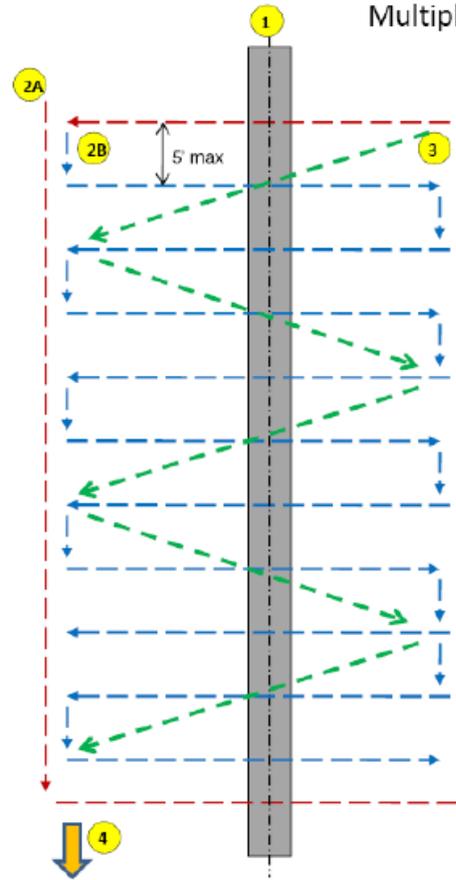


# Safety Issues

- Trencher – Most dangerous piece of equipment on a ROW
- Line sweeps
- Remaining parallel to PL
- OQ reviews
- Contractor safety record
- Pothole/Daylighting plans

## Multiple Inductive and Conductive Sweep Procedure

11/16/2011



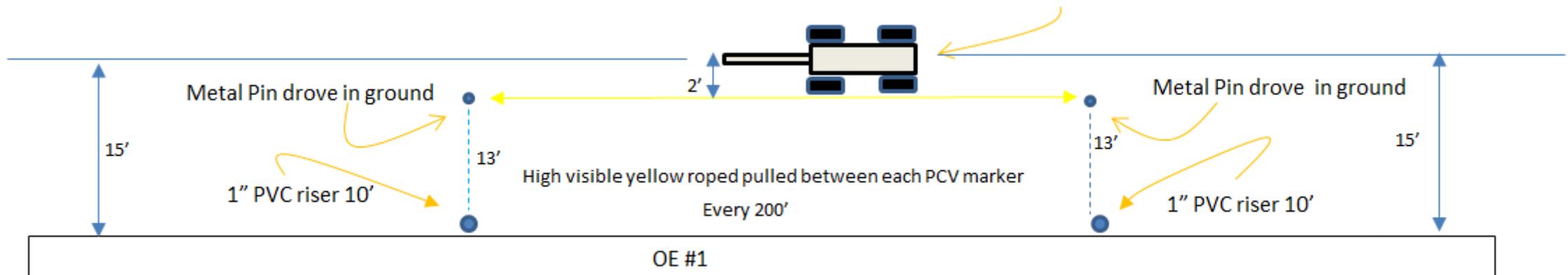
Inductive Sweeps described below shall be performed using at least two different line locating instruments to reduce risk of a instrument malfunction failing to locate an unknown underground facility.

- 1 Inductive Sweep #1: On existing KM pipelines, confirm location and mark centerline of the pipeline. On new construction, perform an inductive sweep to "clear" the proposed trench line.
- 2A Inductive Sweep #2A: Perform an inductive sweep around the perimeter of the excavation area (or section of the excavation area).
- 2B Inductive Sweep #2B: After completing Inductive Sweep #2A, perform an inductive sweep crossing the excavation area every five (5) feet until the entire excavation area has been swept.
- 3 Inductive Sweep #3: Perform an inductive sweep crossing the excavation area in a "Zig Zag" pattern every ten (10) feet until the entire excavation area has been swept. Indicate the area has been swept by writing on centerline stakes "Inductive Sweep, Date, Name"
- 4 If only a section of the excavation area has been swept, then repeat Steps #1, #2, & #3 on the next sections until 100% of the excavation area has been swept.

Note #1: If there is any doubt that the excavation area was not properly swept, repeat the Inductive Sweep Procedure until there is no doubt.

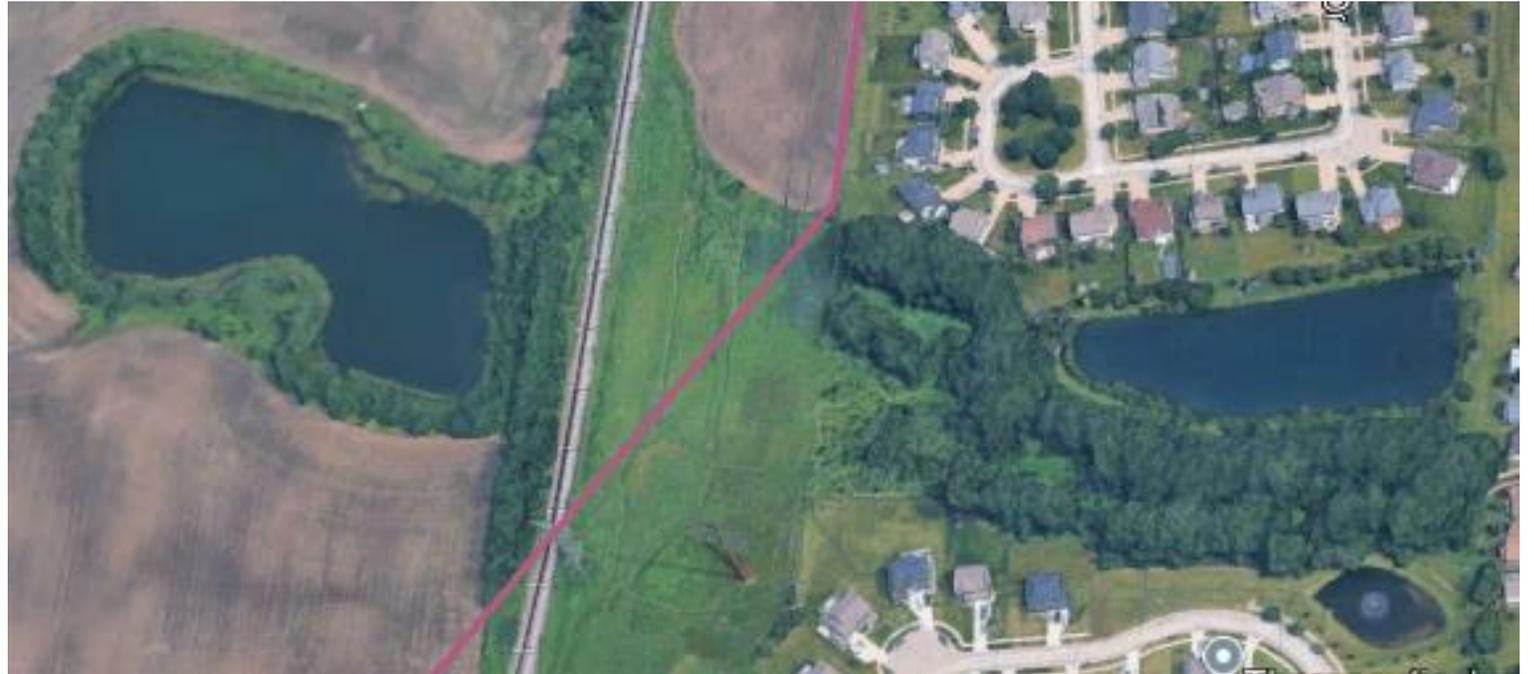
Note #2: If the proposed excavation area is enlarged at any time, then the incremental area must be thoroughly checked via new One Call and inductive and conductive process.

Note #3: If there are any above grade facilities or test leads in the vicinity, a conductive sweep is also required to confirm the location of any below grade facilities that may be connected to the above grade facilities



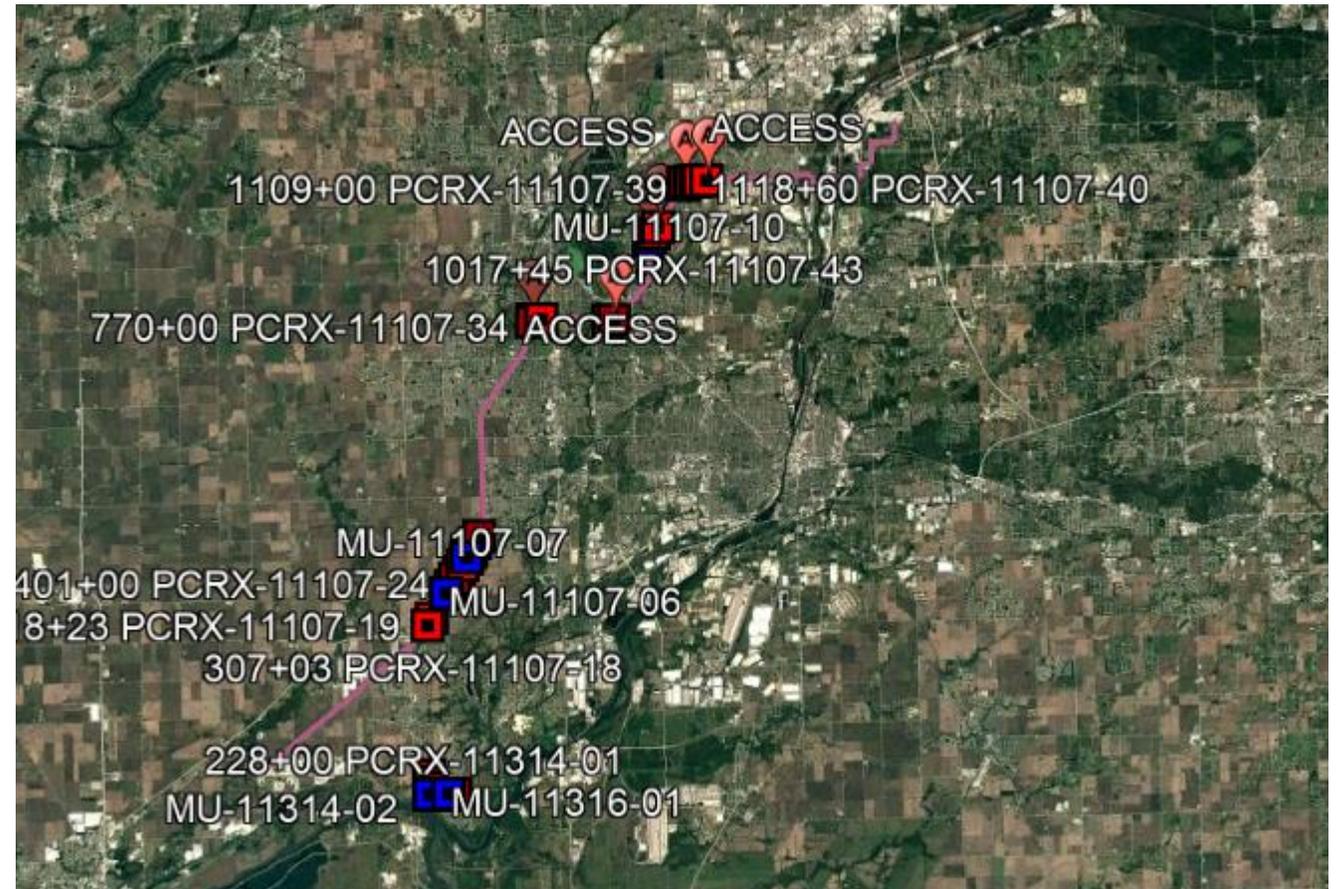
# Environmental Issues

- Water run off
- Swampy conditions
- Erosion Control



# Material Management

- Laydown Yards
- Protected storage location
- Theft Prevention
- Off loading delivery trucks



# Execution Overview

- What is the plan?
- Where to start?
- Operation Support?
- ROW clearance?

## Project Overview:

- On this job, we will be installing approximately 6000 feet of copper ribbon, along with three PCRs equipped with iso switches. Additionally, we will be installing six coupon test stations with RMUs and updating four existing test stations to a dead front style with face plates. We will also be installing six guards.

## Locations:

- Locations to the 4 test stations that we will be updating with dead front face plates.
  - (38.0[REDACTED], -95.100100) Dead front Pipeline D
  - (37.7[REDACTED], -95.100100) Dead front Pipeline YJ
  - (37.7[REDACTED], -95.100100) Dead front Pipeline YJ
  - (37.7[REDACTED], -95.100100) Dead front Pipeline YJ
- PCR and Coupon Test Station Locations
  - (38.0[REDACTED], -95.100100) CTS-1 Pipeline D – 2X2 guard
  - (38.0[REDACTED], -95.100100) PCR-1 / CTS-2 Pipeline D – 4X4 guard
  - (38.0[REDACTED], -95.100100) PCR-2 / CTS-3 Pipeline D – 4X4 guard
  - (38.0[REDACTED], -95.100100) PCR-3 / CTS-4 Pipeline D – 4X4 guard
  - (38.0[REDACTED], -95.100100) CTS-5 Pipeline D – 2X2 guard
  - (37.7[REDACTED], -95.100100) CTS-1 Pipeline YJ – 2X2 guard
- AC Mitigation Locations:
  - Start – (38.0[REDACTED], -95.100100)
  - End – (38.0[REDACTED], -95.100100)
  - Between these start and stop points, this is the only mitigation we are installing on this job, it is a dual run of ribbon with one on each side of the pipe totaling roughly (6000').

# Vendor Selection

- Experience?
- Field Staff – Who is doing the work?
- Reputation?
- References?
- Schedule? When can they start?
- Total Cost?



# Project Management After Award

- Tasks for contractor to complete
  - Provide Schedule
  - Provide installation process review with milestones
  - Personnel – OQ
  - One-call submission
  - Provide Company excavation procedure
  - Order Materials (affects construction schedule)
  - Set up kickoff meeting with shareholders

# Project Management After Award

How to get to the job site?

Each location should have a map to the location with start and stop identified



# Field Work Execution

- What to expect of the Installation crew?
  - Line sweeps to verify the one call
  - Marking the line for the trencher to follow
  - Follow Potholing frequency plans
  - Trenching
    - Ideal to install mitigation while trenching
  - Backfill
    - Leaving backfilled trench level will lead to settling issues

- Typical 4-man crew
  - Trenching crew
  - Pothole vac crew
- Equipment
  - Trencher
  - Skid Steer
  - Vac rig



# Field Work Execution

## Connecting Mitigation Cable sections/Splicing



- 3.** With one hand, grasp one end of the Mitigator 12" back from the cut end and pour out the Powerfill to that point. (Pour the backfill into a container that will be easy to use to pour back into the Mitigator later.) Pull back the outer fabric covering and braiding, but do not cut off. Trim off 6" of the bare copper cable that you have just exposed.



- 4.** Place the exposed ends of the #2 HMWPE cable and the bare #2 copper of the Mitigator into opposite ends of the butt splice connector. Use the proper crimping tool to crimp the connection.

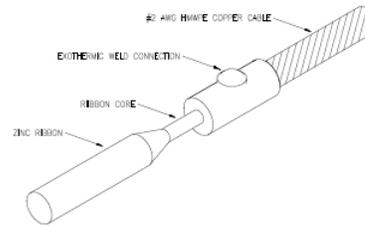


- 5.** Slip the heat shrink tube over the connection and **SAFELY** use the heat gun or heating device to seal the heat shrink around the connection.



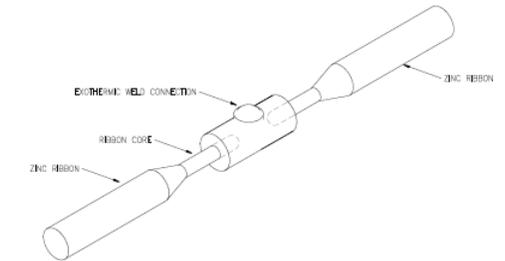
- 6.** When the seal has cooled, pull the fabric sleeve of the Mitigator back up over the spliced and sealed area.

MOLD	ThermOweld: #M12723/Cadweld CASST1V002
EXOTHERMIC WELD CARTRIDGE	ThermOweld: 32
SPUCE KIT	3M Scotchcast: 3M B2-A1

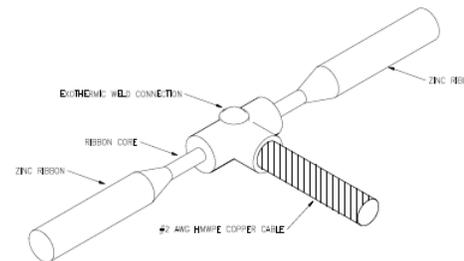


1  
-  
MITIGATION WIRE TO #2 AWG STRANDED (HMWPE) COPPER CABLE  
EXOTHERMIC INSTALLATION DETAIL

MOLD	ThermOweld: #M-7233/Cadweld CASST007
EXOTHERMIC WELD CARTRIDGE	ThermOweld: 15-172, F-33 Alloy
SPUCE KIT	3M Scotchcast: 3M B2-A1



2  
-  
MITIGATION WIRE TO MITIGATION WIRE  
IN-LINE EXOTHERMIC CONNECTION INSTALLATION DETAIL



3  
-  
MITIGATION WIRE TO #2 AWG STRANDED (HMWPE) COPPER CABLE  
"T" CONNECTION INSTALLATION DETAIL

MOLD	ThermOweld: #13341
EXOTHERMIC WELD CARTRIDGE	ThermOweld: 32
SPUCE KIT	3M Scotchcast: 3M 90-B1

**NOTES:**

- ALL EXOTHERMIC WELD CONNECTIONS ARE TO BE SEALED WITH ROYSTON "SPUCE RIMT", 3M "SCOTCHCAST" SPUCE KIT, OR CURRENT APPROVED ALTERNATE.
- FOR ALL T-SPICE CONNECTIONS USE A NON-METALLIC SPLIT TO REINFORCE WELD FOR ADDED SUPPORT. WRAP DUCT TAPE AROUND SPLIT AND COPPER CABLE TO HOLD IN PLACE.

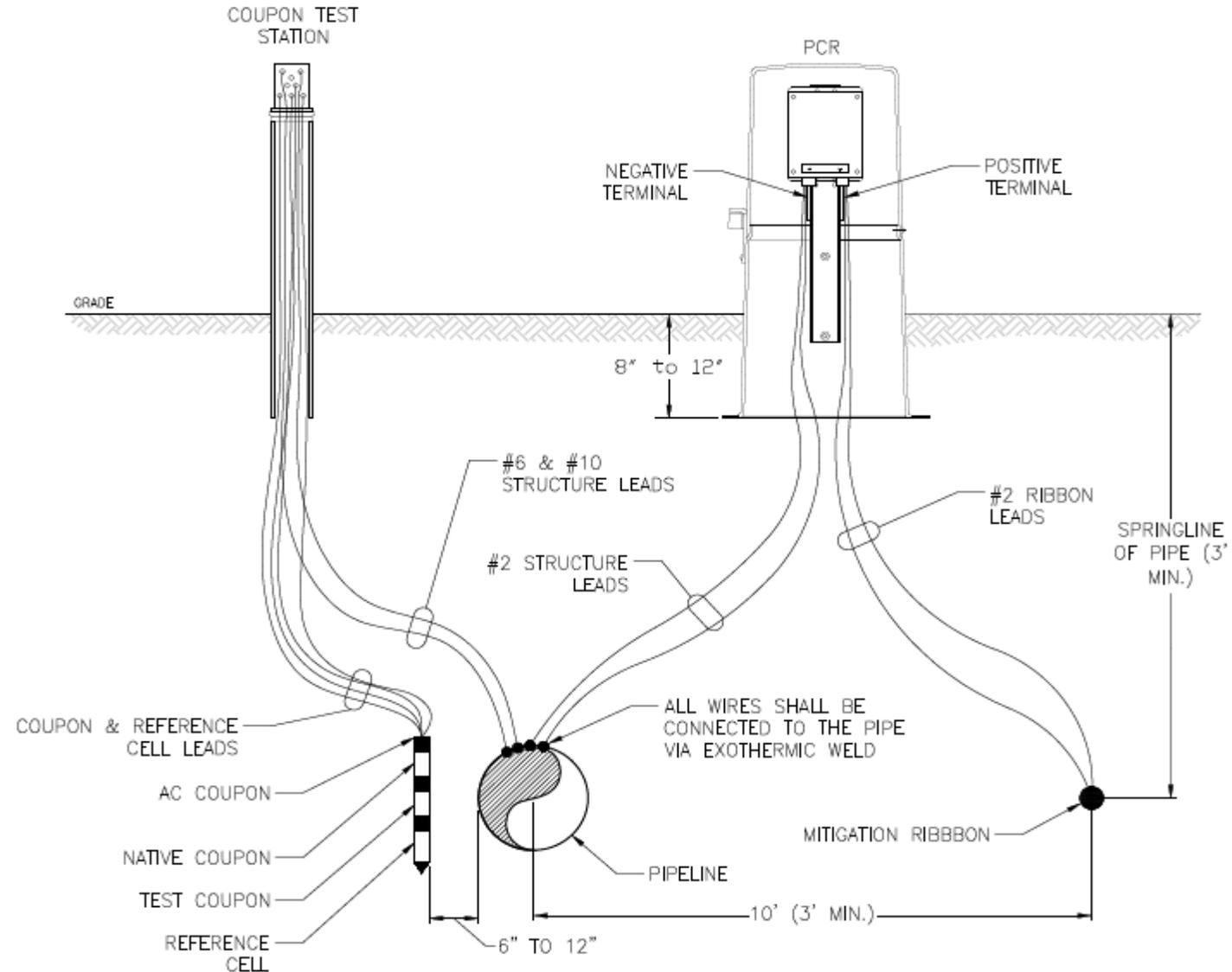
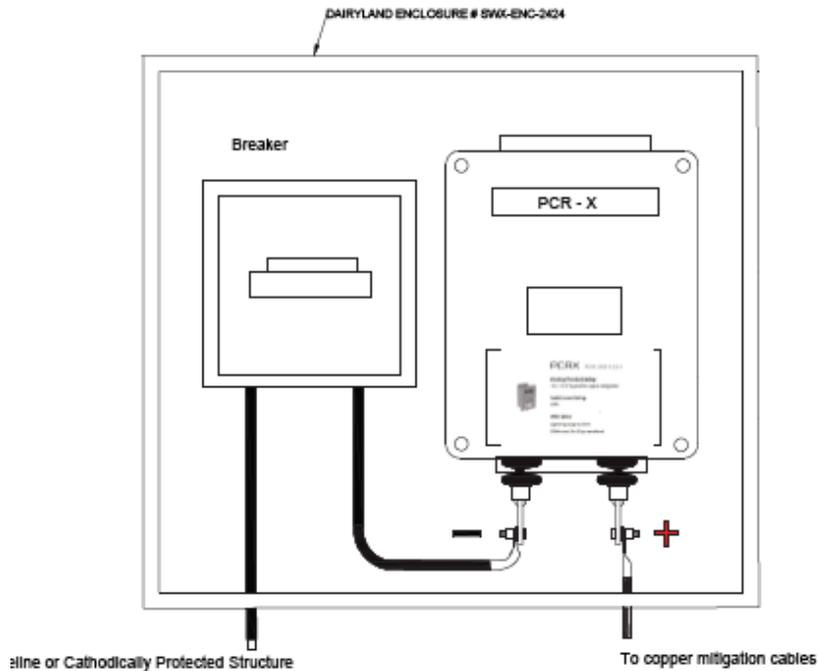
CAUTION  
ZINC RIBBON MUST  
NOT TOUCH PIPE

# Field Work Execution



# Field Work Execution

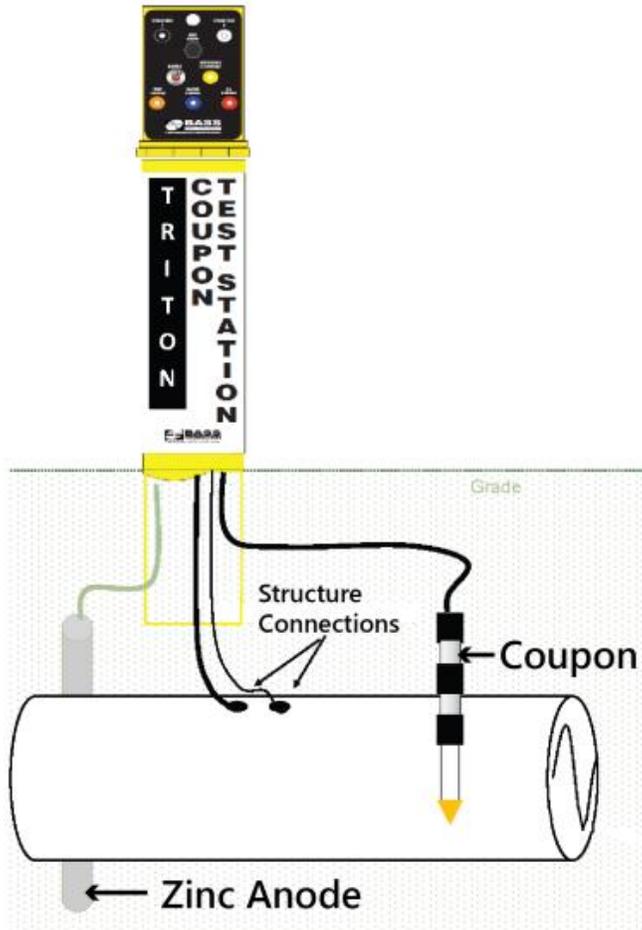
Tie in plans – Always ask about experience of crew to tie in AC system.





# Monitoring AC Mitigation System

- Reconductoring
- Modeling vs. kVAC today



## ICL-C

The MetriCorr ICL-C (Interference Corrosion Logger - Current) is designed for comprehensive CP and AC or DC interference analysis using a high sensitivity ER probe, with the added functionality of measuring line currents as a voltage drop across a known pipeline section. The line current facility can be used to assess the distribution of cathodic protection current in a pipeline system, and thus to locate sections with poor coating integrity. Continuous monitoring of this parameter can be used as an early warning system for third party damages.

- ✓ Line current
- ✓ Corrosion rate
- ✓ DC potential ✓ On (pipeline) ✓ Instant-off (coupon) ✓ IR-free (coupon)
- ✓ DC current density
- ✓ AC voltage
- ✓ AC current density
- ✓ Spread resistance



# Questions?

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