

**LUDLUM MODEL 4525 GENERATION IV SERIES  
RADIATION PORTAL MONITOR**

**MODELS  
4525-5000  
4525-7500  
4525-10000  
4525-12500  
4525-15000**

**INSTALLATION MANUAL**

**August 2023**

**Serial Number GM5179 and Succeeding  
Serial Numbers**

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**LUDLUM MEASUREMENTS, INC**  
501 OAK STREET, P.O. BOX 810  
SWEETWATER, TEXAS 79556  
325-235-9732, FAX: 325-235-8768



## **STATEMENT OF WARRANTY**

Ludlum Measurements, Inc. warrants the portal monitor covered in this manual to be free of defects due to workmanship, material, and design for a period of 24 months from the date of delivery. The calibration of a product is warranted to be within its specified accuracy limits at the time of shipment. **Accessories such as computers, Universal Power Supplies (UPSs), cameras, network equipment, etc., are warranted by the individual manufacturer, and are not covered by Ludlum Measurements.**

This warranty excludes the replacement of instruments, detectors, or parts that are broken due to excessive physical abuse, acts of nature such as lightening, or used for purposes other than intended. Warranty claims requiring an onsite technician will cover labor and parts only. All related travel expenses such as airline costs, meals and incidentals, and lodging are to be paid for by the customer and are not covered by the warranty.

There are no warranties, express or implied, including without limitation any warranty of merchantability or fitness, which extend beyond the description of the face thereof. If the product does not perform as warranted herein, the purchaser's sole remedy shall be repair, recalibration, or replacement, at the discretion of Ludlum Measurements. In no event will Ludlum Measurements be liable for damages, lost revenue, lost wages, or any other incidental or consequential damages, arising from the purchase, use, or inability to use product.

## **RETURN OF GOODS TO MANUFACTURER**

If equipment needs to be returned to Ludlum Measurements, Inc. for repair or calibration, please send to the address below. All shipments should include documentation containing return shipping address, customer name, telephone number, description of service requested, and all other necessary information. Your cooperation will expedite the return of your equipment.

**LUDLUM MEASUREMENTS, INC.  
ATTN: RADIATION SECURITY DIVISION  
501 OAK STREET  
SWEETWATER, TX 79556**

**866-662-0828 325-235-5494  
FAX 325-235-4672**

**GATE MONITOR TECH SUPPORT 800-717-9506 (24 hours)**

**LUDLUM MEASUREMENTS, INC.**

501 Oak Street  
 P.O. Box 810  
 Sweetwater, Texas 79556  
 Website: [www.ludlums.com](http://www.ludlums.com)  
 (800) 622-0828 / (325) 235-5494



**DESIGNER AND  
 MANUFACTURER  
 OF**

*Scientific and Industrial  
 Instruments*

### Ludlum Model 4525 Site Preparation Checklist

This check list and the described photos must be submitted to [rsdtech@ludlums.com](mailto:rsdtech@ludlums.com) prior to scheduling the Commissioning and Start-up of your system. If no email is available these may be Faxed to (325) 235-8768.

**Please be aware there will be additional charges in the case of delays incurred if site is not prepared by arrival.**

Yes/No/NA	Pre-Commissioning & Start-up Site Preparation
	Foundations placed where detectors have a 10 foot (3 M) "buffer zone" in all directions (Installation Manual Drawings 4511-375).
	Install detectors in approved stands, anchored in concrete and placed in an approved configuration.
	Stands must be diagonally square with one another within 0.5 inch (13 mm) .
	Assure the 4525-7000 Series Control Box is to be mounted on the back of the master detector (#1) stand leaving adequate space for technicians to perform work safely.
	AC power must be in an Isolated conduit with a dedicated, visibly identifiable, breaker capable of "lock out tag out" locks.
	Install Detector cable(s) (Belden 8774, 9 pair 100-foot (30 M) provided) in conduit(s) between each detector and the control box, with 24 inches (61 cm) over pull on each end. (Systems with more than 2 detectors, run cable and conduit between the primary and secondary detectors.)
	Mount Infrareds as shown in site layout drawings provided, in the installation manual, and in locations specified on each IR assembly, determined by system purchased.
	Install Cat 5e Ethernet cable, 250 foot (72 M) provided, in conduit and pulled from control system to computer location in office area with 24 inches (61 cm) over pull on each end.
	Computer and printer must be in an easily accessible location, (wall-mount system purchased from Ludlum's is to be mounted on a wall) with proper power and UPS.
	Auxiliary remote, mounted with conduit installed and cable pulled (Belden 9946, 10 conductors 100-foot [30 m] provided)
	Any additional accessories Camera(s), strobe/horn, traffic lights, P2P wireless, etc., with cable(s), installed, according to recommended specifications.
	Customer is responsible to provide a man lift and an OSHA certified lift operator for all overhead detectors. If not provided the technician will arrange for each at customer's expense.
	Customer will provide a safe, stable and clean OSHA certified stepladder for technician's use.
	Photos provided as described in the Photo Requirement List (Next Page)
<b><u>Comments:</u></b>	

Company: \_\_\_\_\_

Location: \_\_\_\_\_

Signature/Date: \_\_\_\_\_

**LUDLUM MEASUREMENTS, INC.**

501 Oak Street  
 P.O. Box 810  
 Sweetwater, Texas 79556  
 Website: [www.ludlums.com](http://www.ludlums.com)  
 (800) 622-0828 / (325) 235-5494



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 OF**

*Scientific and Industrial  
 Instruments*

### Ludlum Model 4525 Site Photo Requirements

This list of Photos and the Check List must be submitted to [rsdtech@ludlums.com](mailto:rsdtech@ludlums.com) prior to scheduling the Commissioning and Start-up of your system. If no email is available these may be Faxed to (325) 235-8768.

**Please be aware there will be additional charges in the case of delays incurred if site is not prepared by arrival.**

Yes/No/NA	Pre-Commissioning & Start-up Site
	<b>3 different angles minimum</b> —Photo(s) showing both detectors in relation to the scale and to ensure the 10 Foot (3M) buffer zone is adequate. (REF: Installation Manual 4511-375) .
	<b>1 each</b> —showing the Control Box mounted on the back side of detector #1 stand and height from ground for easy accessibility, as specified in Installation Manual.
	<b>2 each</b> —Face of each detector, with doors closed, showing the placement of all infrared sensors.
	<b>2 each</b> —Face of each detector, with doors Opened, showing cables pulled through conduits and 24 inches (61cm) over pull.
	<b>2 each</b> —interior of the control box showing the A/C power lines, both detector cables, auxiliary remote cable, sensor wiring and the Cat-5e network cable with 24 inches (61cm) over pull.
	<b>1 each</b> —(If applicable) Photos of the horn/strobe unit and/or camera and/or traffic light, and/or Wireless P2P system (both antenna mounted with unobstructed signal path and connecting cables on each end), mounted with conduit(s) and entering the control box.
	<b>2-4 each</b> —Photo(s) showing the mounted computer, printer and network equipment and cables with Cat5e cable connecting exterior detector, if using purchased system from Ludlum. Photo(s) should reflect the placement of the computer, monitor and printer after installation whether customer supplied or purchased with the system(s). The system will be easily accessible and the monitor should be at eye level seated or standing.
	<b>1 each</b> —Photo of the interior auxiliary remote mounted in its location (if purchased). The photo should also include the cable from the external detector in proximity to the remote.
	<b>1 each</b> —Photos of any additional equipment and its location with respect to its function; such as wireless access points and antennas. These photos should clearly depict the wiring has been installed to control these devices.
	<b>Additional photos</b> — any obstacles, barriers, or other anomalies that could possibly impact the installation and operation of the system as designed should be documented and presented photographically with the required photos and noted below in the comments field.
<b><u>Comments:</u></b>	

Company: \_\_\_\_\_

Location: \_\_\_\_\_

Signature/Date: \_\_\_\_\_

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**Section****1****Overview**

The Ludlum Model 4525 Radiation Portal Monitor or “gate monitor” is designed to detect very low levels of radiation, typically in vehicle loads as they are driven between the detectors. Usually the radiation detectors are placed right before a weigh scale. This manual is intended to assist you in the installation of the system.

Several different models and options are available of the Model 4525. The Generation IV Series can be optimally arranged to monitor moving vehicles entering into the system. Each detector system can be configured with two to six large detectors.

In general, the full model number tells the number of detectors – the Model 4525-5000 is a two-detector system, the Model 4525-7500 is a three-detector system, the 4525-10000 system has four detectors, the Model 4525-12500 has five detectors, and the Model 4525-15000 has six detectors. The model number suffix reflects the total cubic inches of scintillation material used by the combined system. Generation IV systems are upgradeable to more complex configurations.

The detectors are normally mounted to the side of the vehicle, and also sometimes above the vehicle. The detectors are centered around the typical load; your situation or location might require the detectors to be higher or lower than the dimensions shown in the back of this manual.

Each system comes with a wall-mount computer display, printer, and universal power supply (UPS). This computer logs data and displays the current status of the system. It is typically placed inside the scale house, or in close proximity to the scale operator. A remote display, with status lights and a reset button, is also provided. The remote can show the status and allow someone to reset alarms whenever the main computer is inaccessible. It is typically placed in the scale house, or sometimes under a weather-protected porch.

Each system uses infrared sensors to detect the vehicle’s presence, and thus switch from measuring the background radiation to checking for an alarm. Multiple sets of sensors are used to measure the speed of the vehicle and to ensure that the vehicle presence is sensed throughout the passage of the vehicle. The range of vehicle sizes, from flatbed trailers to tall drop-off boxes, necessitates some care in positioning the sensors. The drawings in the back of the manual suggest some mounting heights that have worked at many locations.

**Section****2**

## Detector Stand Installation

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This procedure is intended to outline the stand installation of the Ludlum Model 4525-5000, 4525-7500, Model 4525-10000, Model 4525 12500, and Model 4525-15000 Radiation Detection Systems. It does not cover actual termination of cables, which is normally performed by Ludlum Measurements, Inc. (LMI) technicians. The stand installation covers the following items:

- 1) Shipping Crates
- 2) Stand Location – Buffer Zone
- 3) Stand Orientation
- 4) Typical Stand Setup
- 5) Setting Up The Stands
- 6) Conduit Requirements
- 7) Cable Requirements
- 8) Remote Display
- 9) CAT-5E LAN Cabling
- 10) Supervisor Computer (optional)
- 11) Monitor Computer (optional)
- 12) Miscellaneous Requirements

**Note:**

Drawings of the model numbers listed above are located in the back of this manual. Before building and installing the stands, please review the drawings of the Model 4525 that you have ordered to assist in the installation process.

### Shipping Crates

Each system may be purchased with or without the steel stands that provide protection to the radiation detectors. Purchase of the steel stands from Ludlum Measurements, Inc. facilitates the installation process. The following lists the contents of the shipping crates.

**CRATE CONTENTS OF THE MODEL 4525-5000 WITHOUT STANDS**

The system is shipped in one crate containing:

- Two large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 1 and Detector 2
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 30.5 m (100 ft) cable (Belden 9946 or equivalent)
- One hardware mounting kit containing the following:
  - 8 qty. 1/2-inch x 2 1/4-inch long hex bolts
  - 8 qty. 1/2-inch hex nuts
  - 8 qty. 1/2-inch lock washers
  - 16 qty. 1/2-inch flat washers
- If a computer is purchased with the system, it will be inside the crate.
- Any other optional items will be packed in the crate with the detectors.
- The total shipping weight of the crate is approximately 681 kg (1500 lb).

**CRATE CONTENTS OF THE MODEL 4525-7500 WITHOUT STANDS**

The system is shipped in two crates. The first crate contains: Detector 1 and Detector 2.

- Two large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 1 and Detector 2.

The second crate contains: Detector 3 and peripherals.

- One large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 3.
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 30.5 m (100 ft) cable (Belden 9946 or equivalent)
- One hardware mounting kit containing the following:
  - 12 qty. 1/2-inch x 2 1/4-inch long hex bolts
  - 12 qty. 1/2-inch hex nuts
  - 12 qty. 1/2-inch lock washers
  - 24 qty. 1/2-inch flat washers

- If a computer is purchased with the system, it will be inside the crate.
- Any other optional items will be packed in the crate with the detectors.
- One crate is approximately 681 kg (1500 lb), and the other is approximately 454 kg (1000 lb).

#### **CRATE CONTENTS OF THE MODEL 4525-10000 WITHOUT STANDS**

The system is shipped in two crates.

The first crate contains: Detector 1 and Detector 2 and peripherals.

- Two large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 1 and Detector 2
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 30.5 m (100 ft) cable (Belden 9946 or equivalent)
- Four infrared sensor components with conduit
- One hardware mounting kit containing the following:
  - 16 qty. 1/2-inch x 2 1/4-inch long hex bolts
  - 16 qty. 1/2-inch hex nuts
  - 16 qty. 1/2-inch lock washers
  - 32 qty. 1/2-inch flat washers
- If a computer is purchased with the system, it will be inside the crate.
- Any other optional items will be packed in the crate with the detectors.
- One crate is approximately 681 kg (1500 lb), and the other is approximately 454 kg (1000 lb).

The second crate contains: Detector 3 and Detector 4.

- Two large (approximately (meters)m {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 3 and 4.

**CRATE CONTENTS OF THE MODEL 4525-12500 WITHOUT STANDS**

The system is shipped in two crates.

The first crate contains: Detector 1 and Detector 2 and peripherals.

- Two large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 1 and Detector 2
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 30.5 m (100 ft) cable (Belden 9946 or equivalent)
- Four infrared sensor components with conduit
- One hardware mounting kit containing the following:
  - 20 qty. 1/2-inch x 2 1/4-inch long hex bolts
  - 20 qty. 1/2-inch hex nuts
  - 20 qty. 1/2-inch lock washers
  - 40 qty. 1/2-inch flat washers
- If a computer is purchased with the system, it will be inside the crate.
- Any other optional items will be packed in the crate with the detectors.
- One crate is approximately 681 kg (1500 lb), and the other is approximately 908 kg (2000 lb).

The second crate contains: Detector 3 and Detector 4 and Detector 5.

- Three large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 3, 4 and 5.

**CRATE CONTENTS OF THE MODEL 4525-15000 WITHOUT STANDS**

The system is shipped in two crates.

The first crate contains: Detector 1 and Detector 2 and peripherals.

- Two large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 1 and Detector 2
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 30.5 m (100 ft) cable (Belden 9946 or equivalent)
- Four infrared sensor components with conduit
- One hardware mounting kit containing the following:
  - 24 qty. 1/2-inch x 2 1/4-inch long hex bolts
  - 24 qty. 1/2-inch hex nuts
  - 24 qty. 1/2-inch lock washers
  - 48 qty. 1/2-inch flat washers
- If a computer is purchased with the system, it will be inside the crate.
- Any other optional items will be packed in the crate with the detectors.
- One crate is approximately 681 kg (1500 lb), and the other is approximately 908 kg (2000 lb).

The second crate contains: Detector 3 and Detector 4 and Detector 5 and Detector 6.

- Four large (approximately 116.8 x 116.8 x 22.9 cm {46 in x 46 in x 9 in.}) white detector boxes labeled Detector 3, 4, 5, and 6.

**Pallet Contents of the Model 4525-5000 and 10000 with stands**

It is shipped on one pallet that contains two large yellow I-beam frame assemblies with white detectors attached. For a M 4525-5000, the pallet holds one detector per frame assembly. For the M 4525-10000, the pallet holds 2 detectors per frame assembly. The following items are strapped onto the pallet.

- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 100 foot cable (Belden 9946 or equivalent)
- The Model 4525-12500 and 4525-15000 will have four infrared components with conduit
- If a computer is purchased with the system, it will be shipped in a smaller box strapped to the pallet.
- Any other optional items.
- The total shipping weight of the pallet with the Model 4525-5000 is approximately 1362 kg (3000 lb), Model 4525-10000 is 2270 kg (5000 lb).

**PALLET CONTENTS OF THE MODEL 4525-7500, 12500, AND 15000 WITH STAND**

The system comes on two pallets. The smaller pallet contains two large yellow I-beam frame assemblies with white detectors attached. For a Model 4525-7500, the pallet holds one detector per frame assembly. For the Model 4525-12500 and 15000, the pallet holds 2 detectors per frame assembly. On a Model 4525-7500, the pallet contains Detector 1 and 2. For the Model 4525-12500 and 15000, the pallet contains Detectors 1, 2, 3, and 4.

The large pallet contains a large yellow I-beam frame assembly with multiple white detectors attached. Also strapped to the large pallet are four leg extensions to suspend the overhead frame over the scale or lane. On a Model 4525-7500 the pallet contains Detector 3. For the Model 4525-12500, the pallet contains detector 5. For the Model 4525-15000, the pallet contains Detectors 5 and 6.

The following items are strapped onto the smaller pallet.

- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One remote display with 100 foot cable (Belden 9946 or equivalent)
- The Model 12500 and 15000 will have four infrared components with conduit.
- If a computer is purchased with a system, the computer and white control box enclosure will be shipped in smaller crates strapped to the pallet.

- Any other optional items.
- The total shipping weight of both pallets for the Model 4525-7500 is approximately 2043 kg (4500 lb), Model 4525-12500 is 3405 kg (7500 lb), Model 4525-15000 is 4086 kg (9000 lb).

### **UNPACKING**

- 1) Remove the cardboard and shrink wrap from the stand.
- 2) Remove the peripherals from the crate. Store the peripherals in a safe location.
- 3) On Models 4525-7500, 4525-12500, and 4525-15000, remove the I-beam extensions and keep them accessible for preassembly.

## **Stand Location – Buffer Zone**

For best operation, locate the stands in an area where a 3 m (10 ft) buffer zone can be maintained around the detectors. Typically the stands are mounted about 3 m (10 ft) before the weigh scale. It is important that vehicles stay out of this buffer zone except when they are moving slowly between the detectors. Placing a stop sign at the entrance to this buffer zone is recommended, as well as painting a line on the pavement. See Drawing 511 x 928P. Failure to correctly locate the system or failure to enforce the buffer zone will result in more frequent false alarms. These false alarms are caused by the system having an incorrect measurement of the true background radiation level.

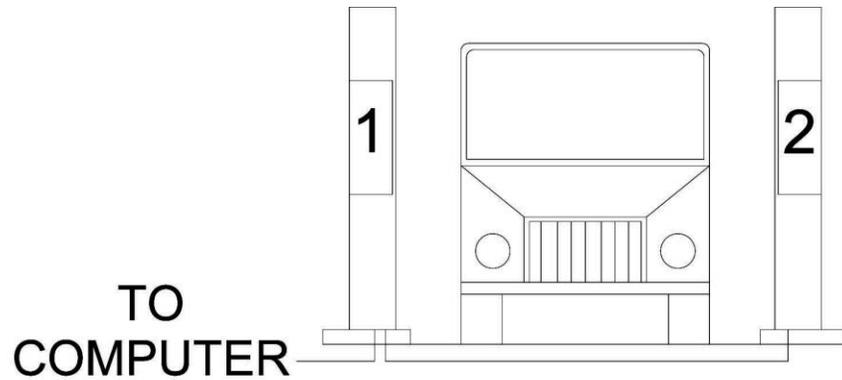
## **Lightning Protection**

Ludlum Measurements offers an optional lightning protection setup to reduce damage from a lightning strike. See drawing 511 x 1067 in the back of the manual for an example. Contact an LMI representative for more information.

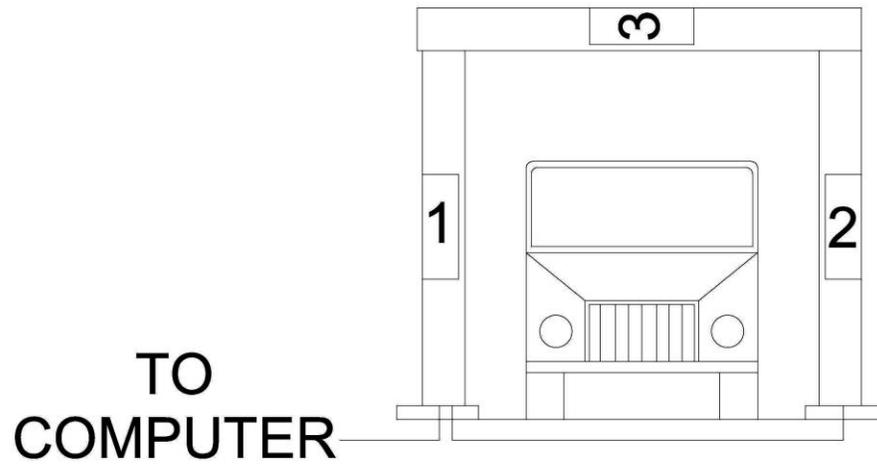
### Stand Orientation

Detector 1 is connected to the office supervisor computer and mains power. Detector 1 should go on the side with the four conduits coming out of the pad. The other detectors are only connected to Detector 1. See figures below for layout.

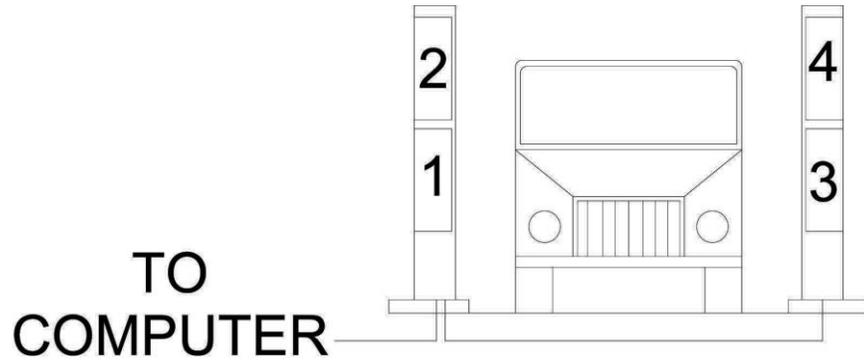
#### MODEL 4525-5000



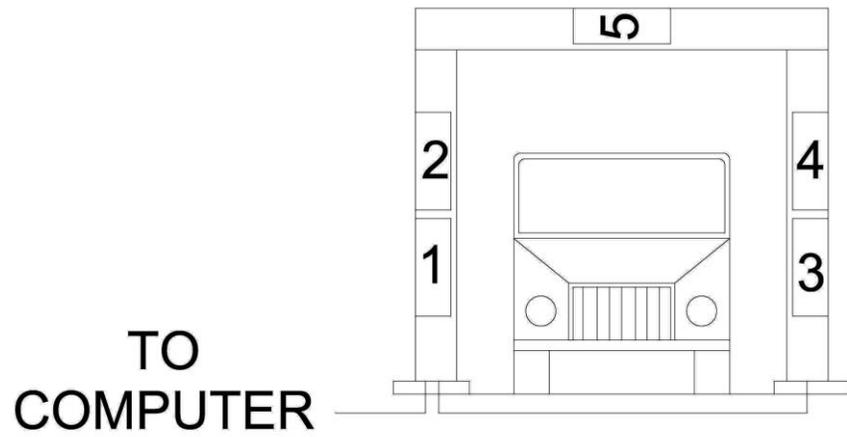
#### MODEL 4525-7500



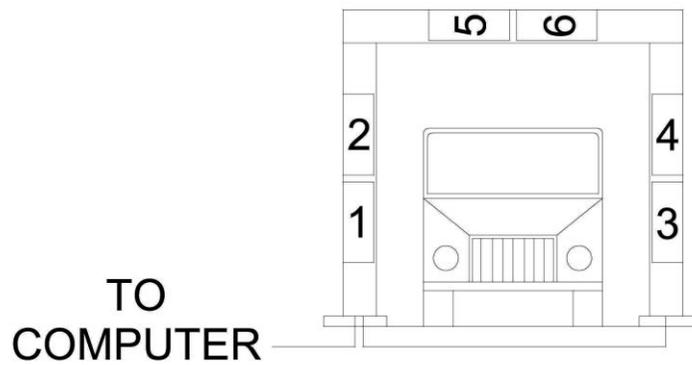
MODEL 4525-10000



MODEL 4525-12500



MODEL 4525-15000



## Typical Stand Setup

To see a typical installation of the gate monitors, see the following drawings:

Model 4525-5000: Drawings 511 x 928 and 511 x 928A

Model 4525-7500: Drawings 511 x 928C and 511 x 928D

Model 4525-10000: Drawings 511 x 928F and 511 x 928G

Model 4525-12500: Drawings 511 x 928I and 511 x 928J

Model 4525-15000: Drawings 511 x 928L and 511 928M

### Notice:

In high background areas, it may be necessary to install additional steel or lead behind the detector enclosure to reduce background.

## Setting up the Stands

### ANCHOR BOLT PATTERN

Due to the close tolerances of the anchor bolt holes, the anchor bolts must be placed according to the dimensions specified on the Anchor Bolt Template drawing: 511 x 997.

### LIFTING

There are 1 x 4 inch rectangular cutouts in the frame pieces that can be used for lifting. Insert a properly rated nylon lifting strap through the cutout. These can be used instead of lifting eyes or clevises.

The weight of the frame pieces vary depending on number and configuration of detectors. See pages 2-2 through 2-7 for approximate weights of your specific system.

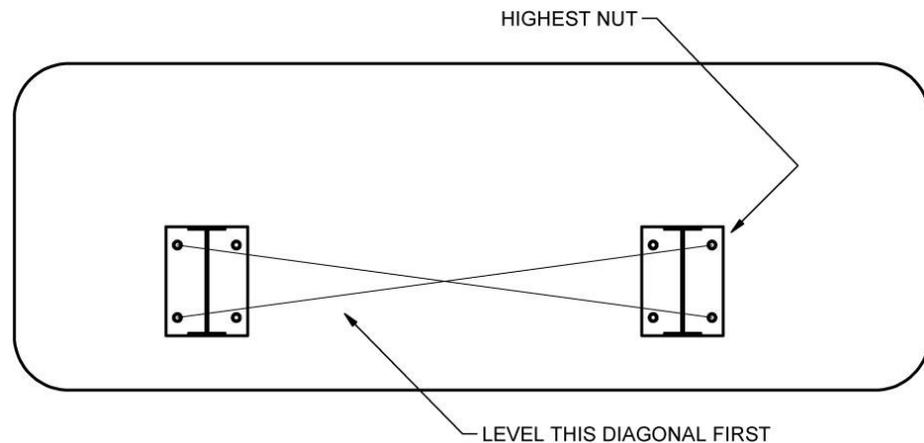
**Note:**

LMI recommends the use of a template to be sure the anchor bolt holes are placed in the correct locations. These can be supplied by LMI. The part numbers are:  
Models 4525-5000 template part number 7511-997 (2 each needed)

The notch on the templates should be placed toward the center of the lane. The anchor bolt holes are a tight tolerance fit for the  $\frac{3}{4}$ -inch anchor bolt; therefore, care must be taken when the anchor bolts are placed in the concrete. Double-nut the anchor bolt to the template before the concrete cures to ensure proper anchor-bolt alignment.

**LEVELING**

- 1) Once the concrete is dry and all the bolts are straight, the mounting points will need to be leveled. Shims may be used, but the following instructions assume the use of leveling nuts.
- 2) Run a set of leveling nuts on the bolts as low as allowable (one nut per bolt).
- 3) Place the flat template for the concrete holes on the leveling nuts.
- 4) Start leveling from the highest nut, using a 0.61 m (2 ft) (or larger) level in the pattern described below. The stands should be level and plumb within 0.17 cm (1/16 of an inch) over a 0.61 m (2 ft) distance.

**Model 4525 Generation IV Series Individual Stand Leveling**

**LIFTING****Systems purchased without stands:**

- Each detector weighs approximately 340 kg (750 lb).
- For side detectors, position lifting straps around and under the detector and carefully raise them into position. Use straps that are capable of holding the weight and that will not scratch or otherwise damage the detectors when being lifted into position. As an alternate method, the detector can be mounted to the back plate, and then the detector and back plate can be lifted together and set into place with a crane or other suitable device, using straps that are properly rated. The weight of one detector and back plate is approximately 680 kg (1500 lb).
- For overhead detectors, the detector can be carefully positioned on its door, and then carefully lifted into place with a forklift or other lifting device. As an alternate method, the detector can be mounted to the back plate, and then the detector and back plate can be lifted together and set into place with a crane or other suitable device, using straps that are properly rated. The weight of one detector and back plate is approximately 680 kg (1500 lb).

**Systems purchased with stands:**

Model 4525-5000 and 4525-7500 side stands

- The weight of one side of the stand assembly with one detector and one back plate attached is approximately 907 kg (2000 lb). Attach properly rated lifting lugs to the top of the stand I-beam legs and carefully lift each side into position. Ensure that each leg is level and plumb and square with the other side before securing it to the concrete pad.

Model 4525-10000, 12500, and 15000 side stands

- The weight of one side of the stand assembly with two detectors and two back plates attached is approximately 1588 kg (3500 lb). Attach properly rated lifting lugs to the top of the stand I-beam legs and carefully lift each side into position. Ensure that each leg is level and plumb and square with the other side before securing it to the concrete pad.

Model 4525-7500, 12500 and 15000 side stand leg extensions

- The weight of each leg extension is approximately 34 kg (75 lb), and the system comes with 4 extensions. Attach properly rated lifting lugs to the top of the extension and carefully lift it into position. Ensure that the extension is square with the top of the leg and attach with the appropriate bolts.

Model 4525-7500, 12500, and 15000 overhead frame

- 4525-7500 and 12500

The weight of one overhead frame with one detector and one back plate attached is approximately 907 kg (2000 lb). Position properly rated lifting straps around and under the frame and carefully lift it into position. Attach the frame with the appropriate bolts.

- 4525-15000

The weight of one overhead frame with two detectors and two back plates attached is approximately 1588 kg (3500 lb). Position properly rated lifting straps around and under the frame and carefully lift it into position. Attach the frame with the appropriate bolts.

#### **TORQUE SPECS FOR $\frac{3}{4}$ -INCH BOLTS/NUTS (NOT SUPPLIED)**

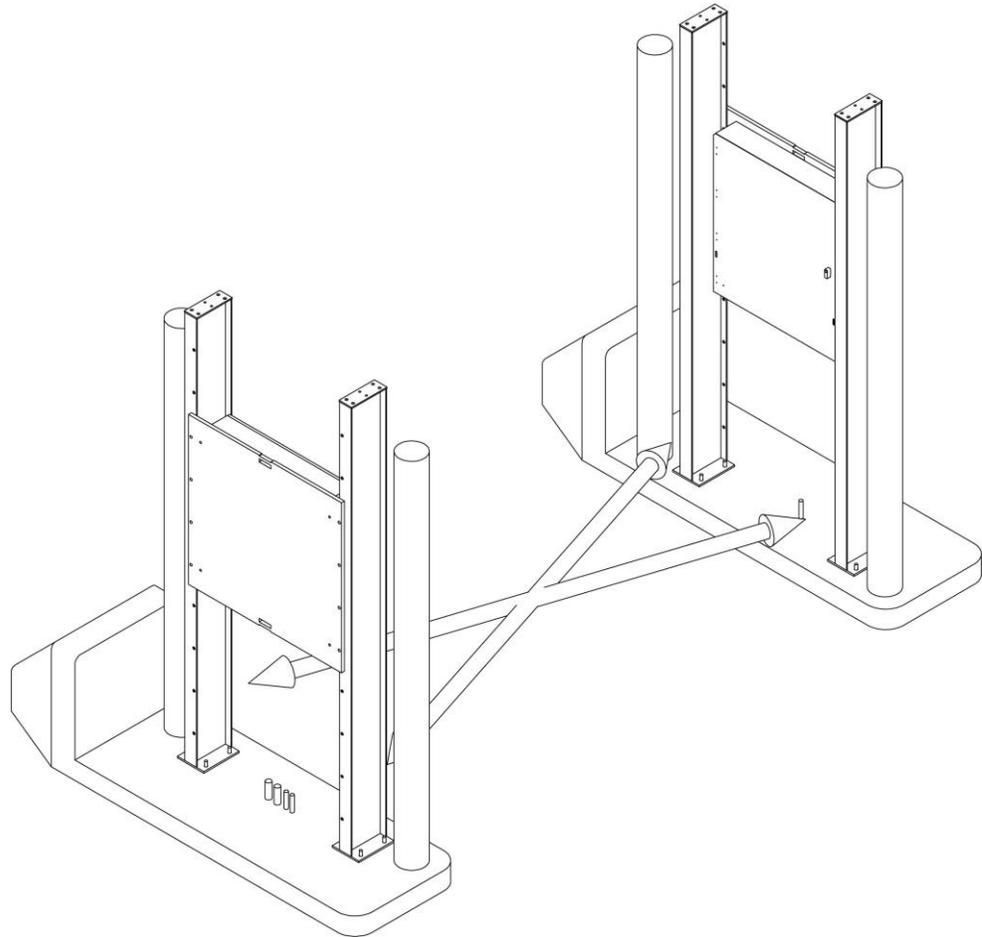
The below estimated torque specifications are offered as the suggested maximum torque values for threaded products and are only a guide.

- The recommended bolts for attaching the stands to the concrete stands are  $\frac{3}{4}$  inch Grade 3 steel anchor bolts or better. Typical tightening torque is 234 ft-lb.
- The recommended bolts for attaching the stands together and mounting the back plates to the stand are  $\frac{5}{8}$  inch, either Grade 3 zinc plated steel or stainless steel or better. Typical tightening torque is 96 ft-lb.

- The recommended bolts for mounting the detectors to the stands are  $\frac{1}{2}$  inch, either Grade 3 zinc plated steel or stainless steel or better. Typical tightening torque is 69 ft-lb.

### SQUARING

The opposing front outside corners of the stands should be within a half-inch of each other on the diagonal reading. Be sure to take the readings at the base of each set of stands (see figures below).



## Conduit Requirements

The bottom of each detector is pre-drilled for conduit connections. Refer to Drawing 511 x 928Q for conduit sizes and locations in the concrete pad.

**Note:**

All additional conduit, from out of the concrete up to the enclosures, should be LIQUID-TIGHT METALLIC.

## Cable Requirements

**AC POWER**

Incoming power from the breaker box for the control box enclosure will be #14-gauge wire for the “hot” and neutral connections, and a # 6-gauge wire for the ground connection.

**OVER PULL FOR TERMINATION**

All wires will be pulled, leaving a 0.61 m (24 in.) tail past the end of the conduit.

**Caution:**

Caution must be used when closing the electronics enclosures. Excessive force could damage the electronic components.

## Wiring

### I/O Relay Board to Interconnect

<b>I/O RELAY BOARD</b> 5396-555 <u>4 Pin MTA (Det 1, 2, or 3)</u>	<b>BELDEN CABLE</b> 8774 OR EQUIVALENT	<b>INTERCONNECT BOARD</b> 5396-933 <u>14 Pin MTA (to electronics)</u>
4	Red from Red/White	14
3	White from Red/White	13
2	Black from Brown/Black	12
1	Brown from Brown/Black	11
<u>10 Pin MTA (Det 1, 2, or 3)</u>		
10	Black from Black/Yellow	10
9	Yellow from Black/Yellow	9
8	Black from Blue/Black	8
7	Blue from Blue/Black	7
6	Black from Green/Black	6
5	Green from Green/Black	5
4	Black from White/Black	4
3	White from White/Black	3
2	Black from Red/Black	2
1	Red from Red/Black	1

Retain Orange/Black and Red/Green pairs for future use by folding them back against the insulated section of the cable, and secure them with electrical tape or zip ties.

## Detector Wiring

### Primary and Secondary Preamp Cable

TO PREAMP

TO INTERCONNECT BOARD

#### 6 Pin MTA Labeled Detector Primary, etc.

10 N/C

9 N/C

8 N/C

7 N/C

6 Green

5 Black from Green Black

4 Black from Red Black

3 Black from White Black

2 White

1 Red

6 Black from Green Black

5 Green

4 Black from White Black

3 White

2 Black from Red Black

1 Red

Black from Yellow Black, Yellow and Black from Blue Black, and Blue wire pairs are cut off and not used.

### Interconnect to IR Sensor Wiring

This is for units with 2 sets of IRs. For units with 4 sets, duplicate this wiring for the other sensors.

#### Master/Primary (#1)

Receiver Incoming Side	Wire Color	MTA#	Label
"B"	Blue/Grey	#3	Cut Black Wire Incoming Side
	White	#2	
	Brown	#1	
Receiver Outgoing Side	Blue	#3	Cut Black Wire Outgoing Side
	White	#2	
	Brown/Grey	#1	

#### Slave/Secondary (#2 on 4525-5000, 7500 #3 on 4525-10000, 12500, or 15000)

Transmitter Incoming Side	"B"	Blue/Grey	#3	Cut Black Wire Incoming Side
		Blank	#2	Cut White Wire
		Brown	#1	
Transmitter Outgoing Side	"A"	Blue	#3	Cut Black Wire Outgoing Side
		Blank	#2	Cut White Wire
		Brown/Grey	#1	

## Remote Display

### MOUNTING

The remote box must be securely attached to the wall using at least two screws. Four holes have been provided to ensure proper attachment. Sound judgment must be used to provide a secure platform for the depression of the reset button. Refer to Drawing 511 × 207A (Model 4525 REMOTE/AUDIO BOX)

Locations of the remote box will be determined by the Location Supervisor (or equivalent) at each location.

### CABLING

The 30.5 m (100 ft) of cable for the remote is provided by the manufacturer and should be Belden 9946 or equivalent.

Cabling will be run in conduit to the office or booth where the remote display is mounted. Once inside, conduit is not required, but could be requested by the Location Supervisor.

Cables outside of conduit will be secured every 0.30 m (1 ft) to prevent entanglement and possible damage to the cable. The cable will be run into the remote box leaving a 0.61 m (2 ft) tail past the inside of the box

## CAT-5E LAN Cabling

The 76.2 m (250 ft) of the cable for the CAT-5E (Ethernet) shall be provided by the manufacturer and shall be Belden 1501A or equivalent.

### AT THE ELECTRONICS

The CAT-5E cabling must be run in separate conduit from the power cabling. All wires will be pulled, leaving a 0.61 m (2 ft) tail past the end of the conduit (electronics side only).

### IN THE OFFICE OR LAN ROOM

The cables must be long enough to reach the dedicated network switch or computer neatly.

## Supervisor Computer

The supervisor computer provides a common link from the monitor(s) to a common screen. This allows the printing of alarms, adjusting of set points, and the monitor of multiple systems at one time. The Supervisor Computer also records data seen from all the systems for further analysis.

## Miscellaneous Requirements

### AC-MAINS POWER REQUIREMENTS

**Each system requires a 2-amp power source of 120–240 Vac.**

LMI recommends dedicated 10-20 amp breakers for each lane and clearly labeling each breaker.

AC power should be delivered to the Master Detector and to the computer in accordance with code requirements, which supersede these instructions. Such requirements, for example, may require a disconnect device in clear sight of the hard-wired control box.

Power entering the Master Detector must be grounded to a ground lug bushing before connecting the ground to the equipment.

### CONDUIT REQUIREMENTS

All flexible conduit must be liquid-tight, metallic.

All connections to the system must be metallic fittings.

All wiring must be inside conduit except when inside buildings.

**Section****3****Software & Network Installation**

---

**Software Installation****Hardware Requirements:**

Windows XP Pro with SP3 or Windows 7 Pro (32-bit or 64-bit), Enterprise, or Ultimate

**Minimum PC Requirements:**

1.6 GHz processor or greater

1 GB of memory (2 GB recommended)

64 GB hard drive for storing the database and the images

SVGA monitor capable of a resolution of 640 x 480 or greater

Sound card with speakers for audible voice alarms

**Note:**

Before installing any new software, please read the Ludlum Measurements software license agreement at the end of this section and un-install all previous versions.

The Supervisor will install automatically when the CD is loaded in the drive. To install the Data Viewer, navigate to the Data Viewer folder on the CD and double-click on “setup.exe.”

## Network Installation

The software uses both UDP (User Datagram Protocol) and TCP (Transmission Control Protocol) to communicate with the Model 4525. For communication between the Supervisor software and the Model 4525, port 23 (TCP) and port 20034 (UDP) are used.

### TOOLS REQUIRED

Wire Strippers

Network Cable Tester

Network Cable Crimper

RJ-45 connectors appropriate for cable conductor type

Category 5E Network Cable, Stranded or Solid conductor. Stranded cable is generally used where the network cable can be moved, such as patch cables. Solid cable is used where the cable will be fixed, such as internal wiring in walls.

### NETWORK EQUIPMENT

A 100 mega-bit switch with enough ports is needed to connect all Model 4525s, workstations, and cameras (optional). Each computer workstation must have a 100 MB Ethernet network interface card (NIC) installed.

### IP ADDRESSES

Each device on a network has a unique address. This number is called the Internet Protocol (IP) Address. This number can either be dynamically or statically assigned. A static IP address is assigned to the device and will not change. A dynamic IP address is assigned by a Dynamic Host Configuration Protocol (DHCP) server and will not always have the same IP address. The format is a 32 bit numeric address written as four numbers separated by periods (dot). Each of the four numbers range from 0 to 255.

**Note:**

The Model 4525s DO NOT support Dynamic IP Addresses and must be configured for a static IP Address.

The Model 4525s, workstations, and cameras (optional) normally exist on a separate network from any other computers/devices. The network is set up using a Class C address range, which limits the total number of addresses

from 192.168.200.2 to 192.168.200.254 (192.168.200.1 is reserved for default.) Workstation IP addresses begin at 192.168.200.2. Model 4525 IP addresses begin at 192.168.200.4. Camera IP addresses begins at 192.168.200.20. Any other device will use IP addresses beginning at 192.168.200.200. The IP addresses are assigned as follows:

Workstation 1	192.168.200.2
Workstation 2	192.168.200.3
Model 4525 #1	192.168.200.4
Model 4525 #2	192.168.200.5
Model 4525 #3	192.168.200.6
Model 4525 #4	192.168.200.7
Camera #1	192.168.200.20
Camera #2	192.168.200.21
Camera #3	192.168.200.22
Camera #4	192.168.200.23
Wireless A	192.168.200.228
Wireless B	192.168.200.229

#### **MODEL 4525 NIC CONFIGURATION**

If the Model 4525s have never been configured, use the IP Setup Tool.exe to search for and display the current IP address configuration. Select each Model 4525 found and set the IP address according to the table above. The network mask is always 255.255.255.0. The Gateway and DNS can be left at their default values. The baud rate should be set to 57600. Click Set to save the settings to the Model 4525 NIC.

#### **WORKSTATION CONFIGURATION**

1. Select Start/Control Panel/Network and Internet Connections.
2. Click on Network Connections.
3. Right click on Local Area Connection and select Properties.
4. Select Internet Protocol (TCP/IP) and click Properties.
5. Select "Use the following IP Address."
6. Type in the IP address for this workstation.
7. Type in the subnet mask (255.255.255.0).
8. Leave all other fields set to the default values and click OK.
9. Click OK to close the Local Area Connection Properties window.

To check the IP address on a workstation, open a command prompt (Start/All Programs/Accessories/Command Prompt) and type “ipconfig” and press [Enter]. The current network configuration for the Local Area Connection will be displayed.

To test the network connection to any other device on the network, use the “ping” command. This command will transmit data to the specified IP address and display the time it takes to reach the remote address. If the destination is unreachable, the remote address may not be on the network, or the workstation may not be connected to the network.

## **CABLE TERMINATION**

### **Technical Specification for TIA/EIA 568A & 568B Standard for CAT-5E Cable**

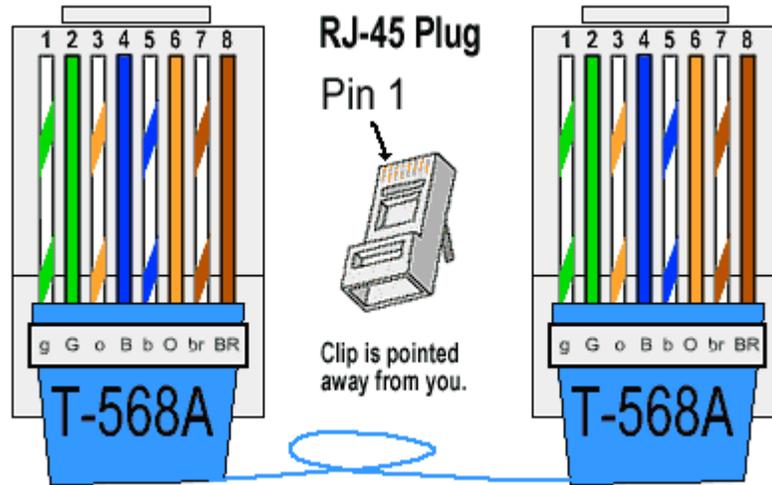
T568A and T568B are the two color codes used in wiring RJ45 eight-position modular plugs. The American National Standard Institute/Telephone Industry Association/Electronics Industry Association (ANSI/TIA/EIA) wiring standards allow both of these color codes. The only difference is that the orange and green pairs are interchanged.

Because it provides backward compatibility for both one pair and two pair of Universal Service Order codes (AT&T) and USOC wiring schemes, the T568A wiring pattern is recognized as the preferred wiring pattern for this standard. This standard should be used in all new installations; however, it makes absolutely no functional difference which you choose.

The T568B standard is the most widely used wiring scheme, as it matches the older AT&T 258A color code. It is also permitted by the ANSI/TIA/EIA standard, but it provides only a single pair backward compatibility to the USOC wiring scheme.

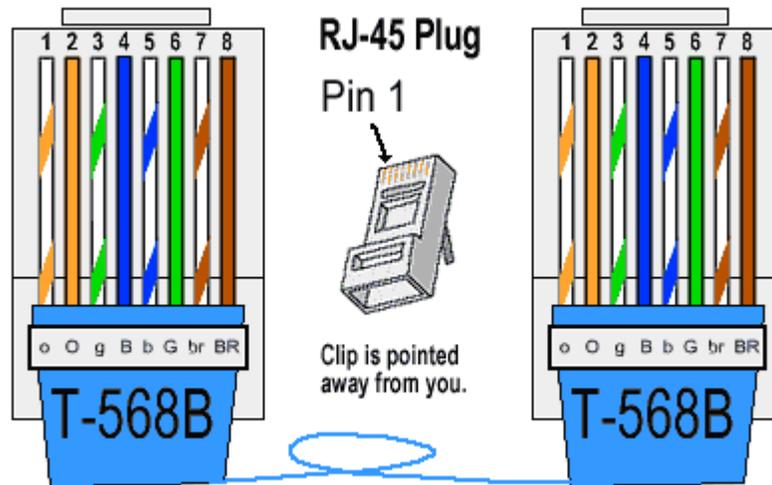
U.S. Government regulations require the use of the preferred T568A standard for wiring done under federal contracts.

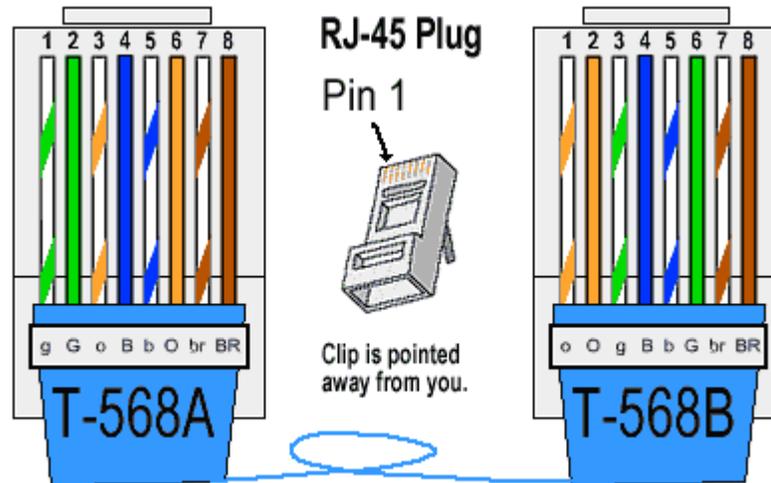
**T-568A STRAIGHT-THROUGH ETHERNET CABLE**



The T-568A Standard should be used in all new installations.

**T-568B STRAIGHT-THROUGH ETHERNET CABLE**



**RJ-45 CROSSOVER ETHERNET CABLE**

A crossover cable is required to connect two devices directly without using a hub or switch or when connecting two hubs together. A crossover cable is made by wiring one end to the T-568A standard and the other end to the T-568B standard.

**Ethernet Cable Instructions****Note:**

Do not deform, bend, stretch, staple, run parallel with power cables, or run Ethernet cables near noise, inducing components!

The total length of wire segments between a device and a hub/switch or between two devices cannot exceed 100 meters (328 ft) for 100Base-TX and 300 m (984 ft) for 10Base-T.

Looking at the connector with the pins at the top and facing you, pin 1 is on the left and pin 8 is on the right.

- Pin 1 – White/Green
- Pin 2 – Green
- Pin 3 – White/Orange
- Pin 4 – Blue
- Pin 5 – White/Blue
- Pin 6 – Orange
- Pin 7 – White/Brown
- Pin 8 – Brown

1. Strip off approximately 2.5 cm (1 in.) of the cable jacket. Be careful not to nick any of the wires or you will need to start over.
2. Untwist the four pairs and straighten them out.
3. Arrange them in a fan shape following the color order above with the White/Green wire on the left and the Brown wire on the right.
4. Bring the wires together until they touch. Double-check the order.
5. Cut the wires to make a 90° angle approximately 1.3 cm (0.5 in.) from the end of the jacket. The wires must be cut straight so that they fit all the way into the connector to make good contact with the pins.
6. Align Pin 1 of the cable with Pin 1 of the connector and insert the cable into the connector. Push firmly so the wires go all the way to the top of the connector, and the jacket goes into the connector by about 0.48 cm (0.19 in.). Again, check to make sure the colors are in the right order. No more than 1.3 cm (0.5 in.) of the Ethernet cable should be untwisted; otherwise, it will be susceptible to crosstalk.
7. Place the connector into the crimp tool and squeeze the handle hard.
8. Inspect the connector to make sure all pins were crimped.
9. Repeat steps 1-8 for the other end.
10. Use a cable tester to test the cable for shorts and crossed wires.

**Note:**

A straight-through cable is used to connect the Model 4525 to a computer when a hub or switch is used. A crossover cable is used to connect the Model 4525 directly to a computer WITHOUT a hub or switch.

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**LUDLUM MEASUREMENTS, INC.**

501 OAK ST., P.O. BOX 810

SWEETWATER, TX 79556

325/235-5494 FAX: 325/235-4672

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## Software License Agreement

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Rev. (number) 1.0

Written by (or Revised by):

Date: 20 Jan 06

Approved by:

*Richard Stroka*  
*Ed Em*

Date: 20 JAN 06

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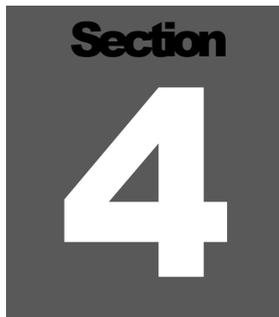
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A dark gray square with the word "Section" in white at the top and a large white number "4" in the center.

## Drawings & Diagrams

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**Model 4525-5000 system**

Model 4525-5000 TYPICAL INSTALLATION, Drawing 511 x 928  
Model 4525-5000 DETECTOR ELEVATION, Drawing 511 x 928A  
Model 4525-5000 RAIN SHIELD, Drawing 511 x 928Y  
Model 4525-5000 POST HOLE INSTALLATION, Drawings 517 x 9 through 517 x 9F (7 drawings)  
Model 4525-5000 SENSITIVE AREA, Drawing 511 x 928B

**Model 4525-7500 system**

Model 4525-7500 TYPICAL INSTALLATION, Drawing 511 x 928C  
Model 4525-7500 DETECTOR ELEVATION, Drawing 511 x 928D  
Model 4525-7500 SENSITIVE AREA, Drawing 511 x 928E

**Model 4525-10000 system**

Model 4525-10000 TYPICAL INSTALLATION, Drawing 511 x 928F  
Model 4525-10000 DETECTOR ELEVATION, Drawing 511 x 928G  
Model 4525-10000 SENSITIVE AREA, Drawing 511 x 928H

**Model 4525-12500 system**

Model 4525-12500 TYPICAL INSTALLATION, Drawing 511 x 928I  
Model 4525-12500 DETECTOR ELEVATION, Drawing 511 x 928J  
Model 4525-12500 SENSITIVE AREA, Drawing 511 x 928K

**Model 4525-15000 system**

Model 4525-15000 TYPICAL INSTALLATION, Drawing 511 x 928L  
Model 4525-15000 DETECTOR ELEVATION, Drawing 511 x 928M  
Model 4525-15000 SENSITIVE AREA, Drawing 511 x 928N

**Applicable to 4525-5000, 4525-7500, 4525-10000, 4525-12500, and 4525-15000**

Model 4525 AREIAL VIEW (Buffer Zone), Drawing 511 x 928P  
Model 4525 Series PLAIN VIEW, Drawing 511 x 928Q  
Model 4525 STAND RIGHT LEG, Drawing 511 x 928R  
Model 4525 STAND LEFT LEG, Drawing 511 x 928S  
Model 4525 STAND EXTENSION, Drawing 511 x 928T  
Model 4525 STAND BACK PLATE, Drawing 511 x 928U  
Model 4525 STAND OVERHEAD, Drawing 511 x 928V  
Model 4525 Series BLOCK OPTIONS, Drawing 517 x 682  
Model 4525 REMOTE CABLE, Drawing 511 x 140  
Model 4525 CONT-PRIM & PREAMP CBL, Drawing 511 x 413  
Model 4525 REMOTE, Drawing 511 x 207A

Model 4525 COMPUTER, Drawing 396 x 850

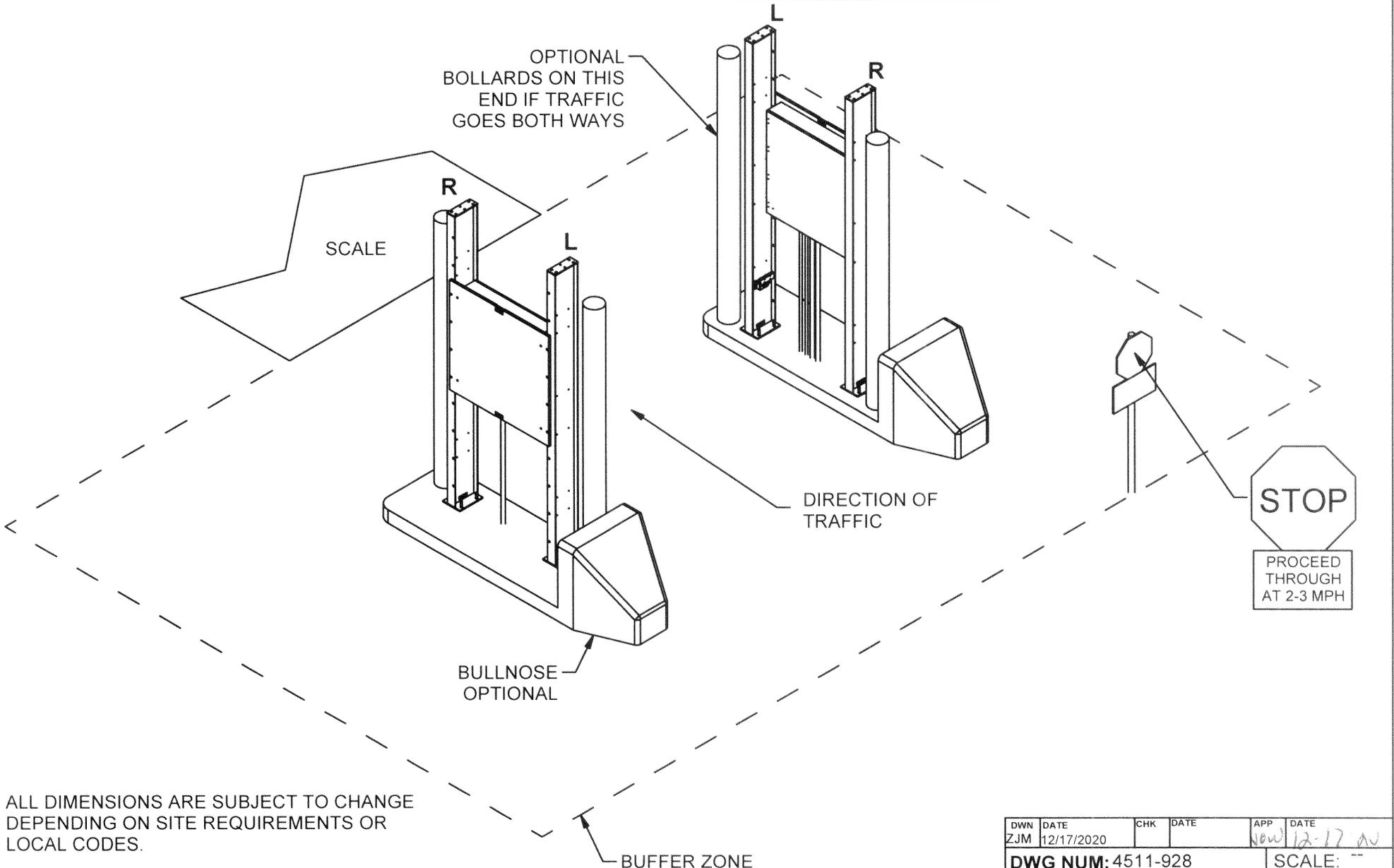
Model 4525 ANCHOR BOLT TEMPLATE, Drawing 511 x 997

Model 4525 ANCHOR BOLT AND CONCRETE, Drawing 511 x 836

Model 4525 GEN IV LIGHTNING PROTECTION, Drawing 511 x 1067

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
3	UPDATED SENSOR HEIGHT DIMENSION	5-31-13	MCK
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



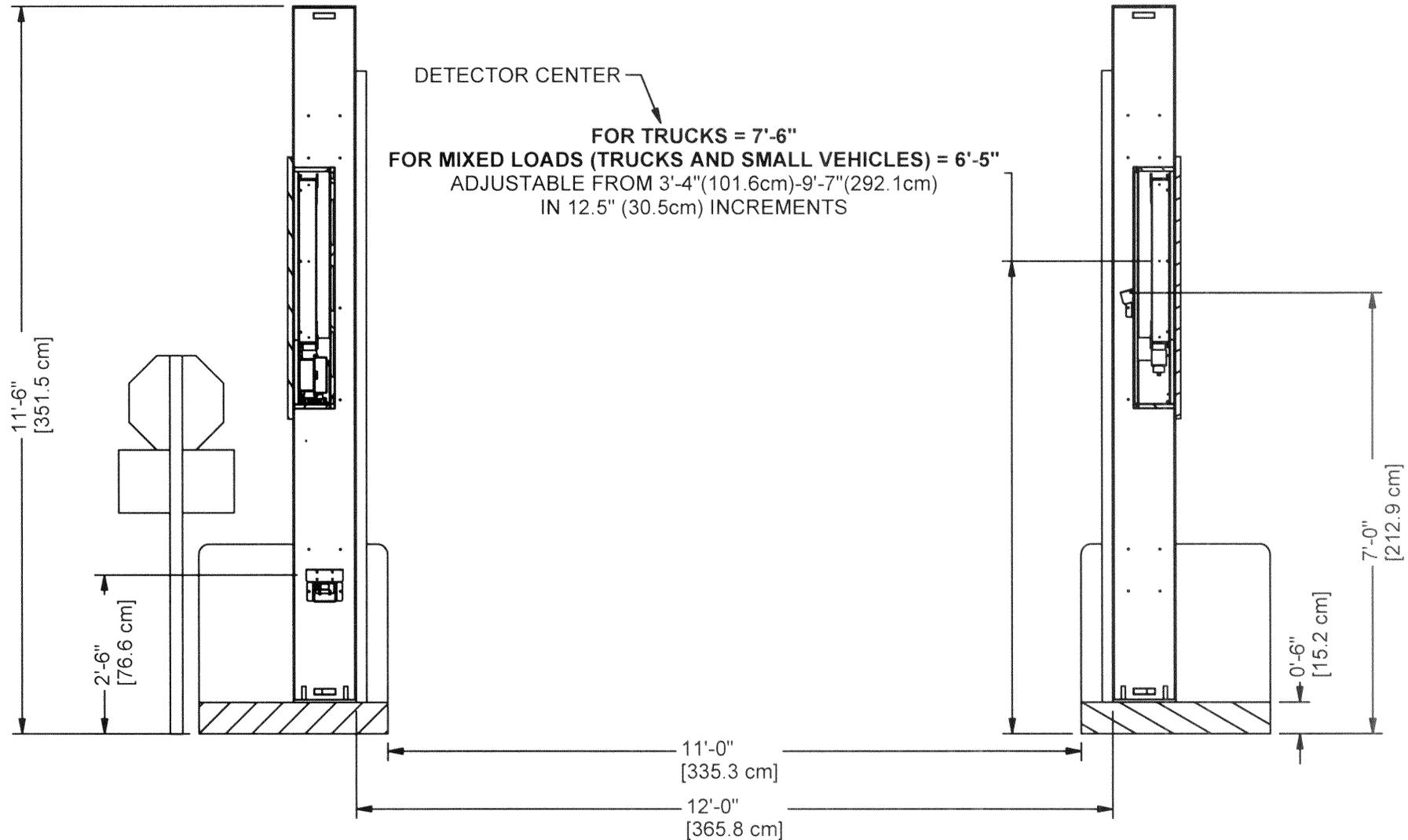
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

SEE SHEET 928Q FOR CONCRETE DETAILS AND 928R-928V FOR STAND DETAILS.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/17/2020			<i>new</i>	12-17-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5000 TYPICAL INSTALLATION</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928	

REVISION HISTORY

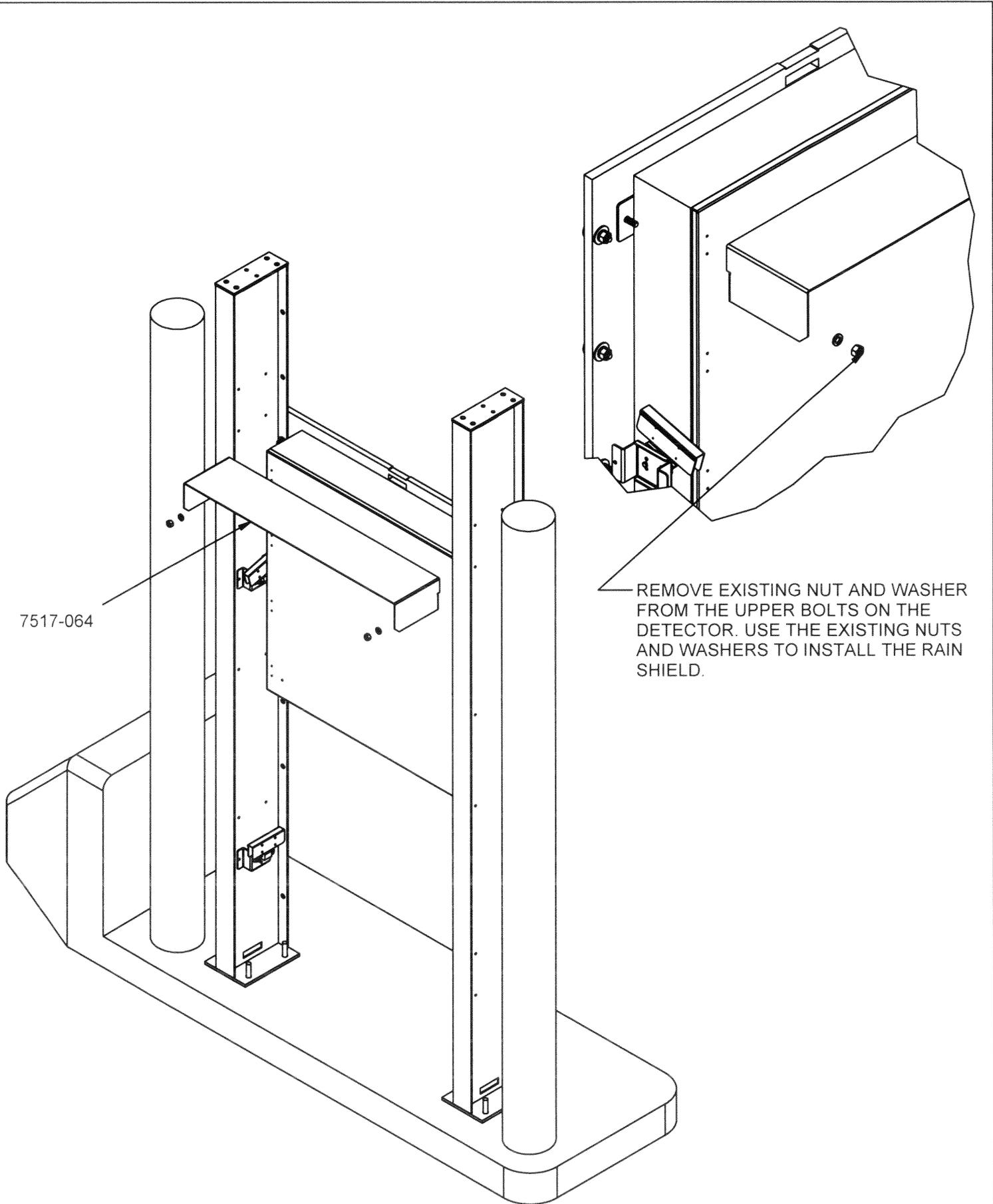
REV	DESCRIPTION	DATE	BY
3	UPDATED SENSOR HEIGHT DIMENSION	5-31-13	MCK
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



NOTE: 12' DETECTOR SPACING IS RECOMMENDED FOR MAXIMUM SENSITIVITY. DETECTOR SPACING SHOULD NOT EXCEED 14'.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			<i>Now</i>	11-30-20
DWG NUM: 4511-928				SCALE: --	
TITLE M 4525-5000 DETECTOR ELEVATION					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			511	928A	



7517-064

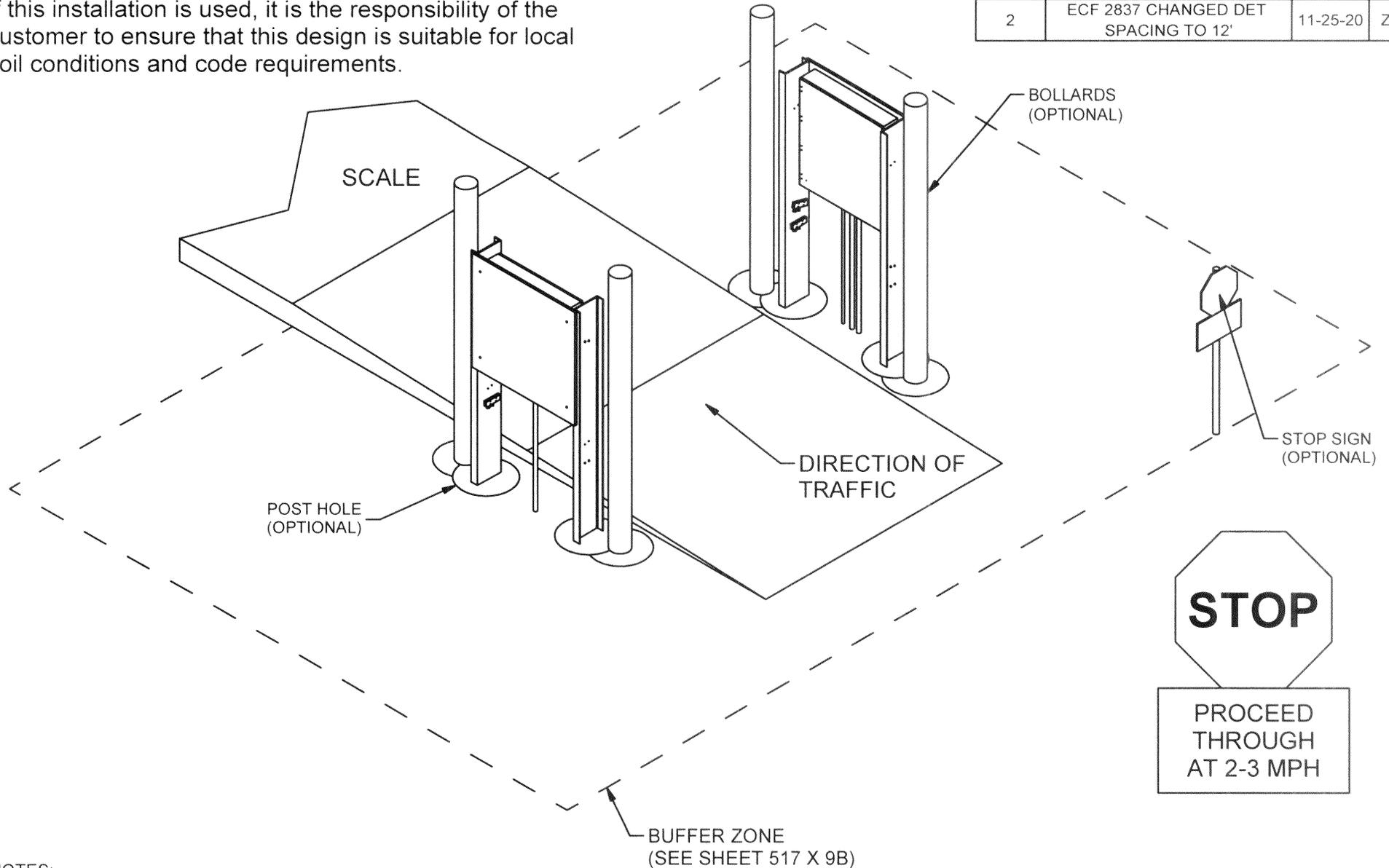
REMOVE EXISTING NUT AND WASHER FROM THE UPPER BOLTS ON THE DETECTOR. USE THE EXISTING NUTS AND WASHERS TO INSTALL THE RAIN SHIELD.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/1/2020			J6w	12-1-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5K RAIN SHIELD INSTALL</b>					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			511	928W	

DISCLAIMER: Ludlum Measurements recommends the installation shown on drawings 511X928 and 511X928K. If this installation is used, it is the responsibility of the customer to ensure that this design is suitable for local soil conditions and code requirements.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
2	ECF 2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM



NOTES:

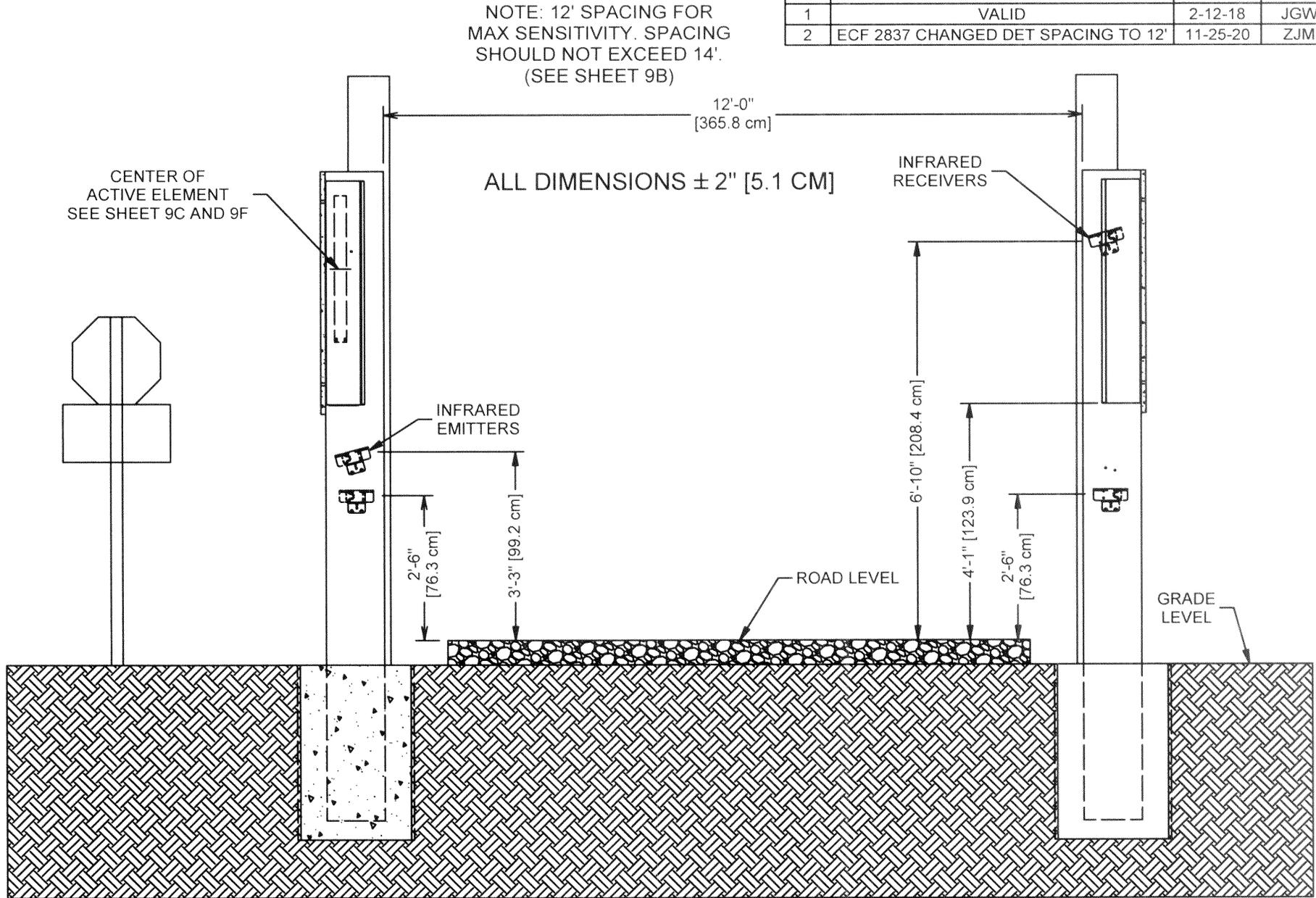
IF BACKGROUND RADIATION LEVELS ARE HIGH, ADDITIONAL SHIELDING MAY BE REQUIRED.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES. CONTACT MANUFACTURER IF ANY CONFLICTS ARISE.

BOLLARDS ARE OPTIONAL, BUT RECOMMENDED FOR PROTECTION FROM COLLISIONS

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			LOW	11-30-20
<b>DWG NUM: 4517-009</b>				SCALE: --	
<b>TITLE M 4525-5K POST HOLE TYP INST</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 517	SHEET 9	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
2	ECF 2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM

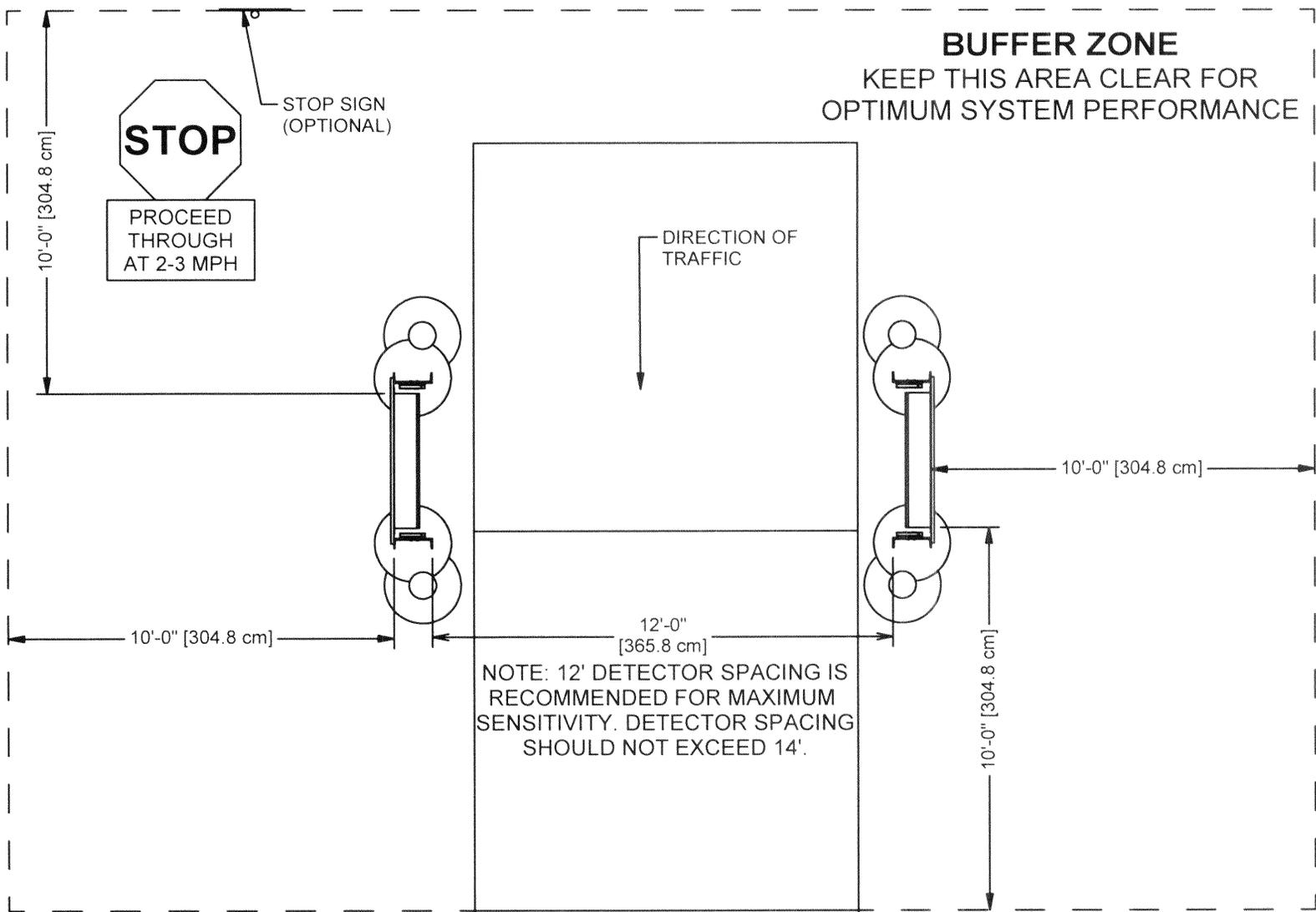


NOTES:

IF BACKGROUND RADIATION LEVELS ARE HIGH, ADDITIONAL SHIELDING MAY BE REQUIRED.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES. CONTACT MANUFACTURER IF ANY CONFLICTS ARISE.

DWN ZJM	DATE 11/30/2020	CHK	DATE	APP Jgw	DATE 11-30-20
<b>DWG NUM: 4517-009</b>				SCALE: --	
<b>TITLE M 4525-5K POST HOLE ELEVATION</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 517	SHEET 9A		



ALL DIMENSIONS ± 6" [15.2 CM]

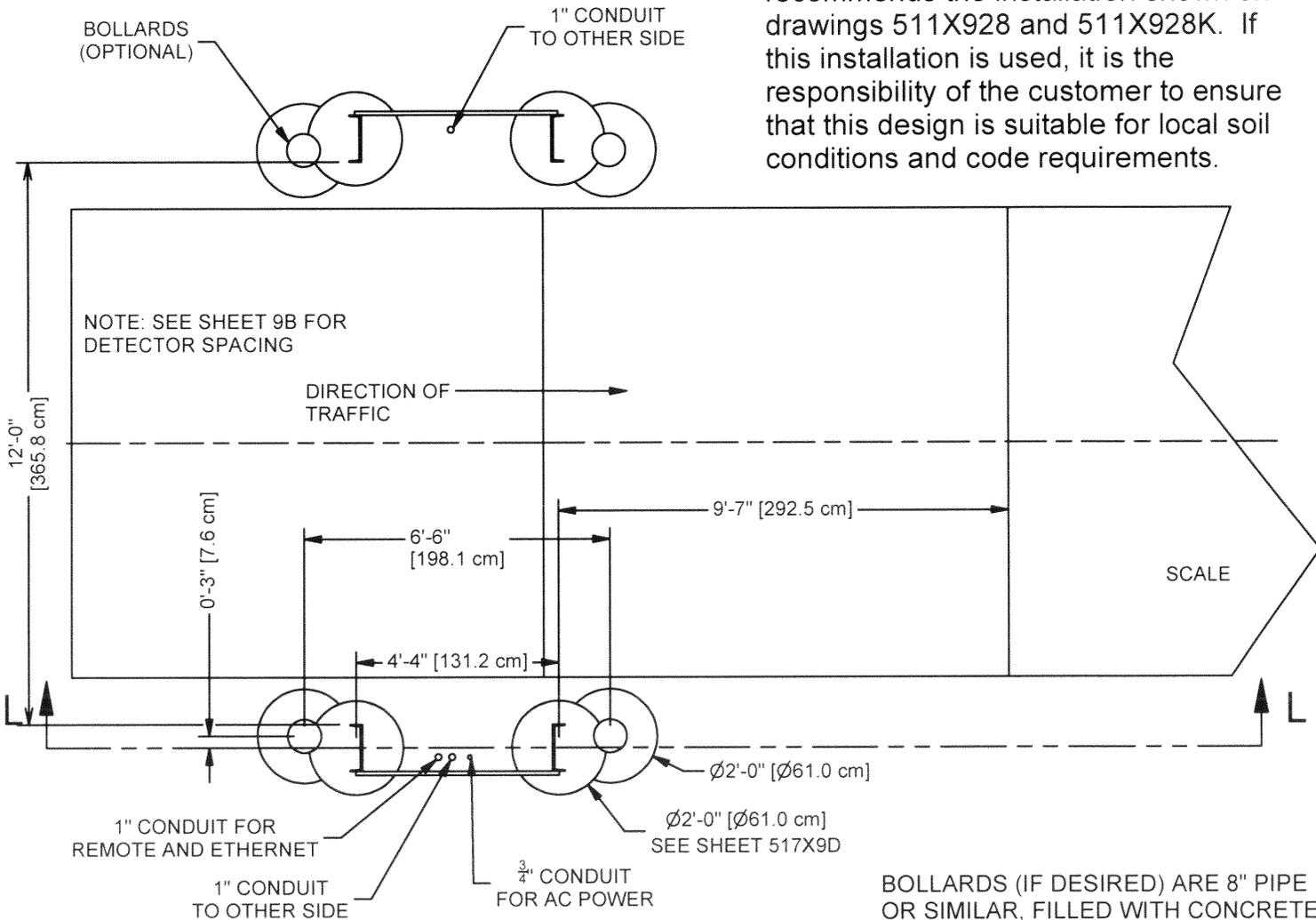
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
2	ECF 2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM

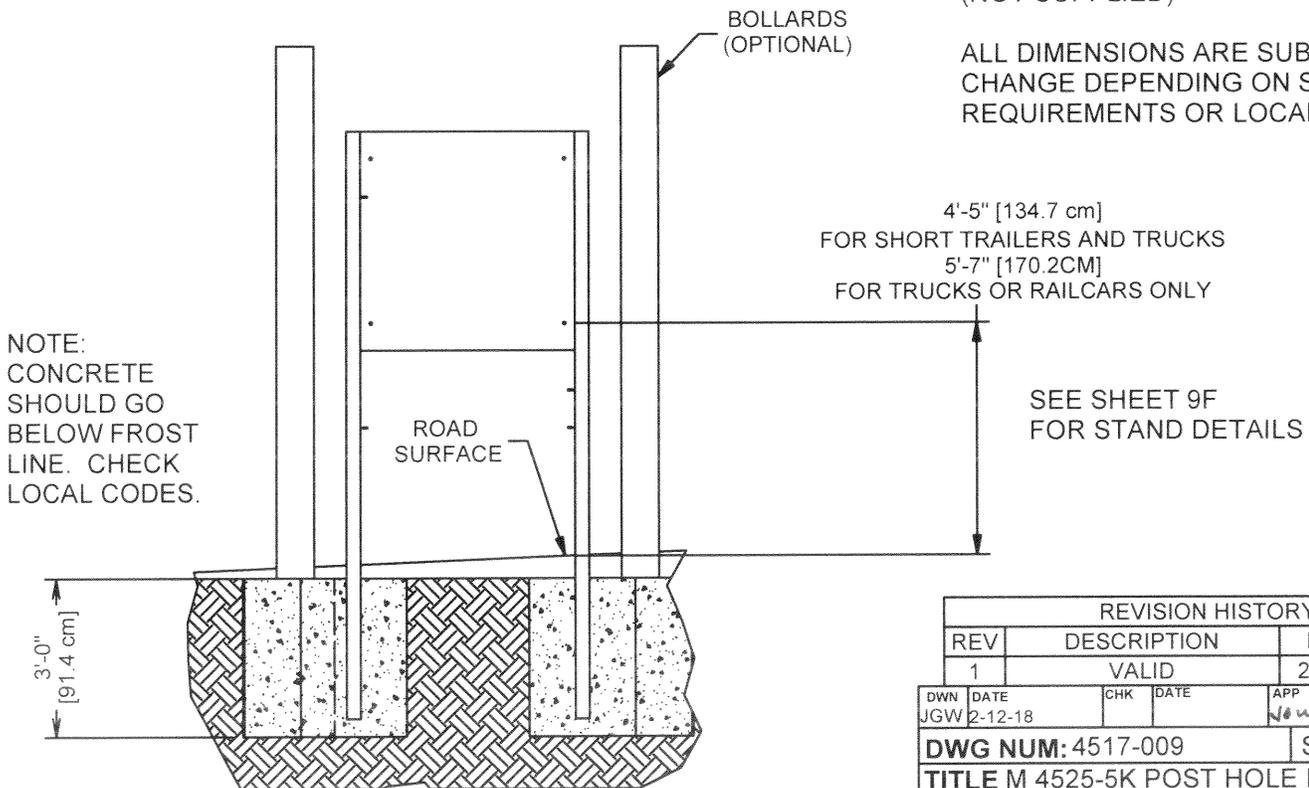
DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			Jew	11-30-20
<b>DWG NUM: 4517-009</b>					SCALE: --
<b>TITLE M 4525-5K POST HOLE AERIAL VIEW</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 517	SHEET 9B	

**DISCLAIMER:** Ludlum Measurements recommends the installation shown on drawings 511X928 and 511X928K. If this installation is used, it is the responsibility of the customer to ensure that this design is suitable for local soil conditions and code requirements.



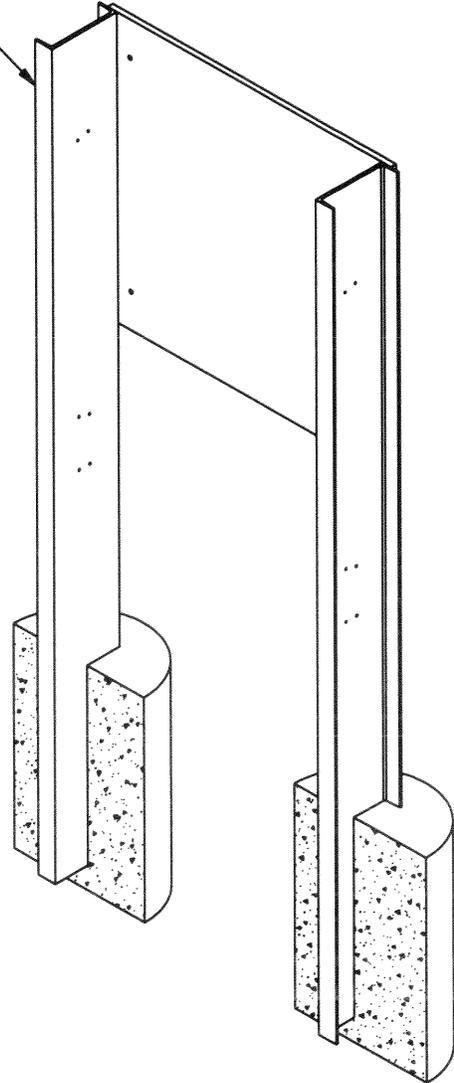
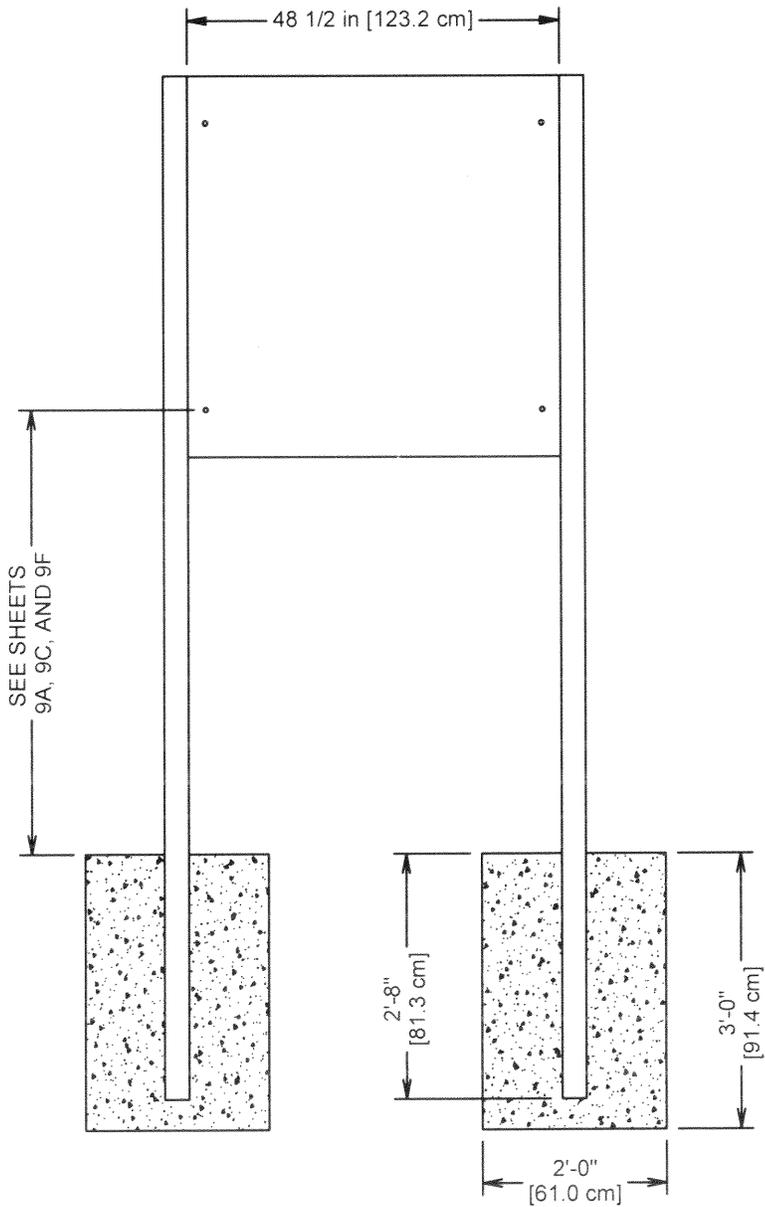
BOLLARDS (IF DESIRED) ARE 8" PIPE OR SIMILAR, FILLED WITH CONCRETE (NOT SUPPLIED)

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.



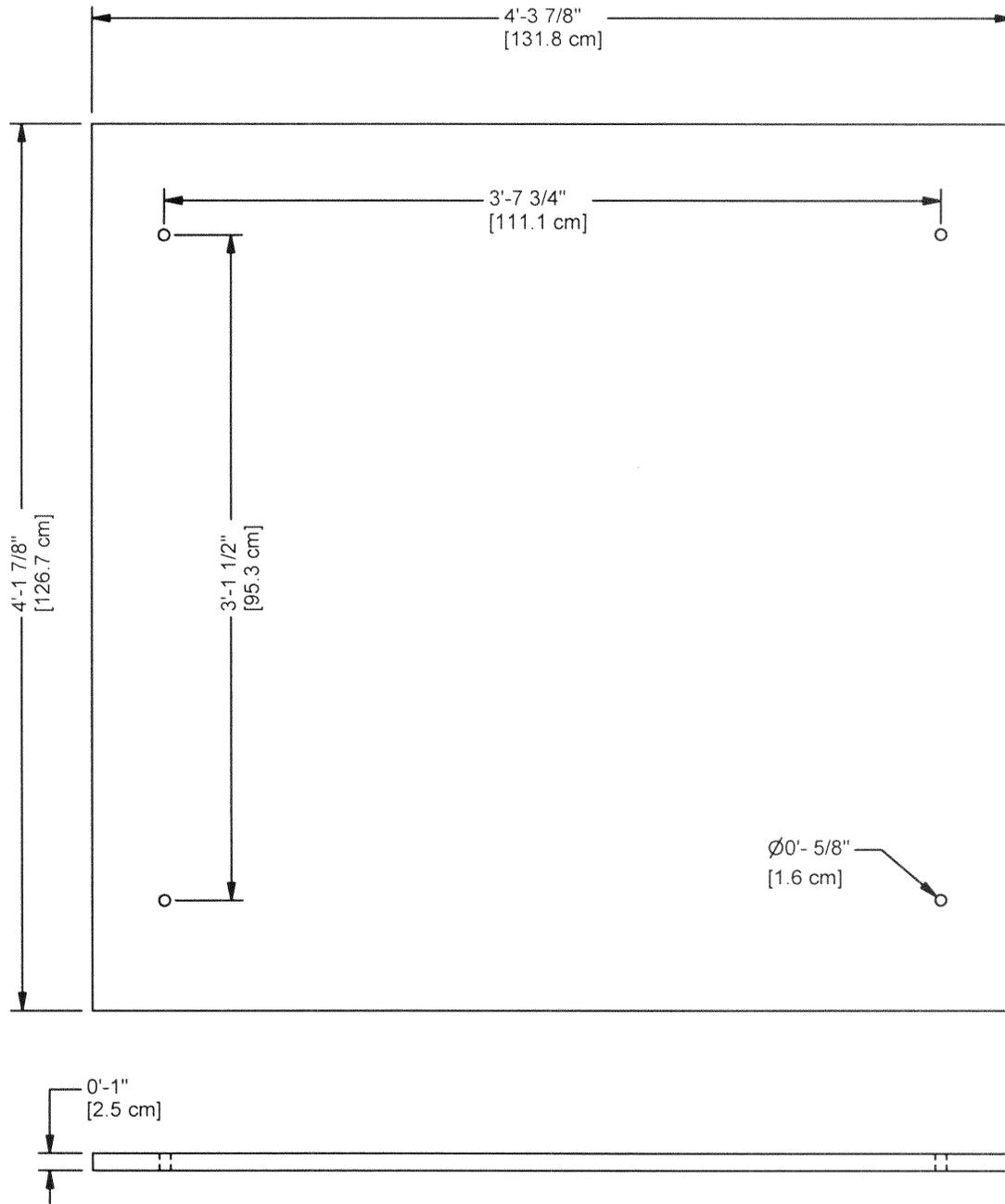
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
DWN	DATE	CHK	DATE
JGW	2-12-18		
APP	DATE		
JGW	11-30-20		
DWG NUM: 4517-009		SCALE: .023	
TITLE M 4525-5K POST HOLE PAD			
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 517	SHEET 9C

SEE SHEET 9F  
FOR STAND INFO

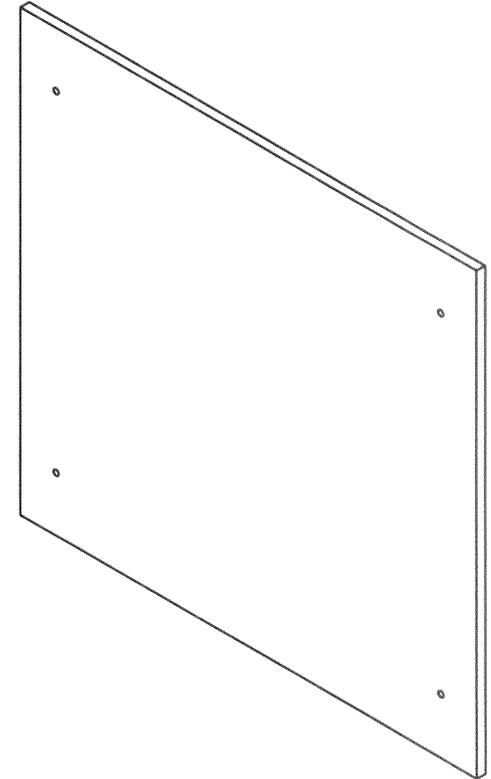


REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
2	ECF 2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			N6W	11-30-20
<b>DWG NUM:</b> 4517-009				<b>SCALE:</b> --	
<b>TITLE</b> M 4525-5K POST HOLE CONCRETE					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			<b>SERIES</b> 517	<b>SHEET</b> 9D	



REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
2	ECF 2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM

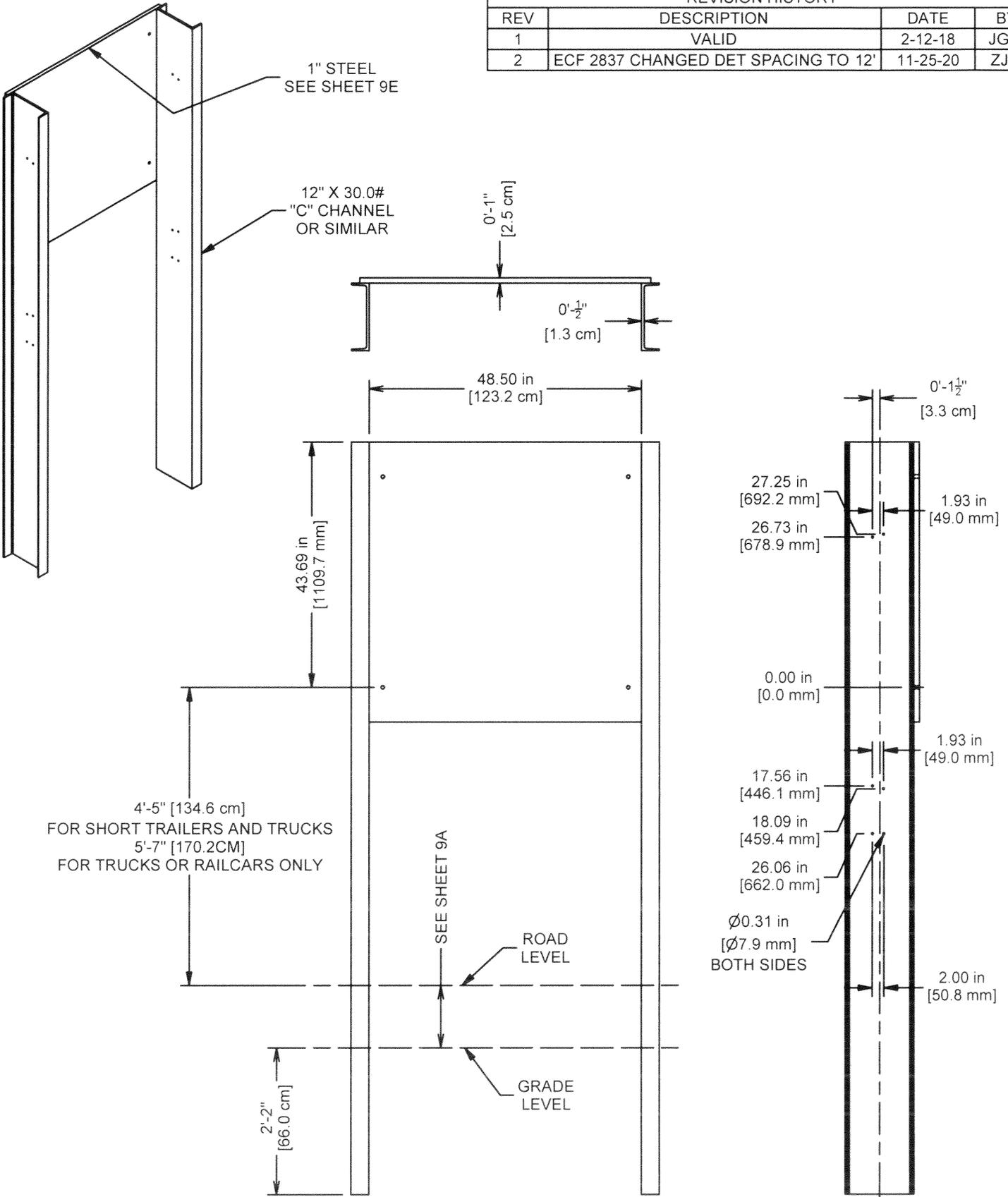


**MATERIAL:**  
STEEL

SHIELDING BACK PLATE  
CAN BE PURCHASED FROM LMI, P/N 7517-128

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			JGW	11-30-20
<b>DWG NUM:</b> 4517-009				<b>SCALE:</b> --	
<b>TITLE</b> M 4525-5K WELD ON 1" BCK PLATE					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		<b>SERIES</b> 517	<b>SHEET</b> 9E		

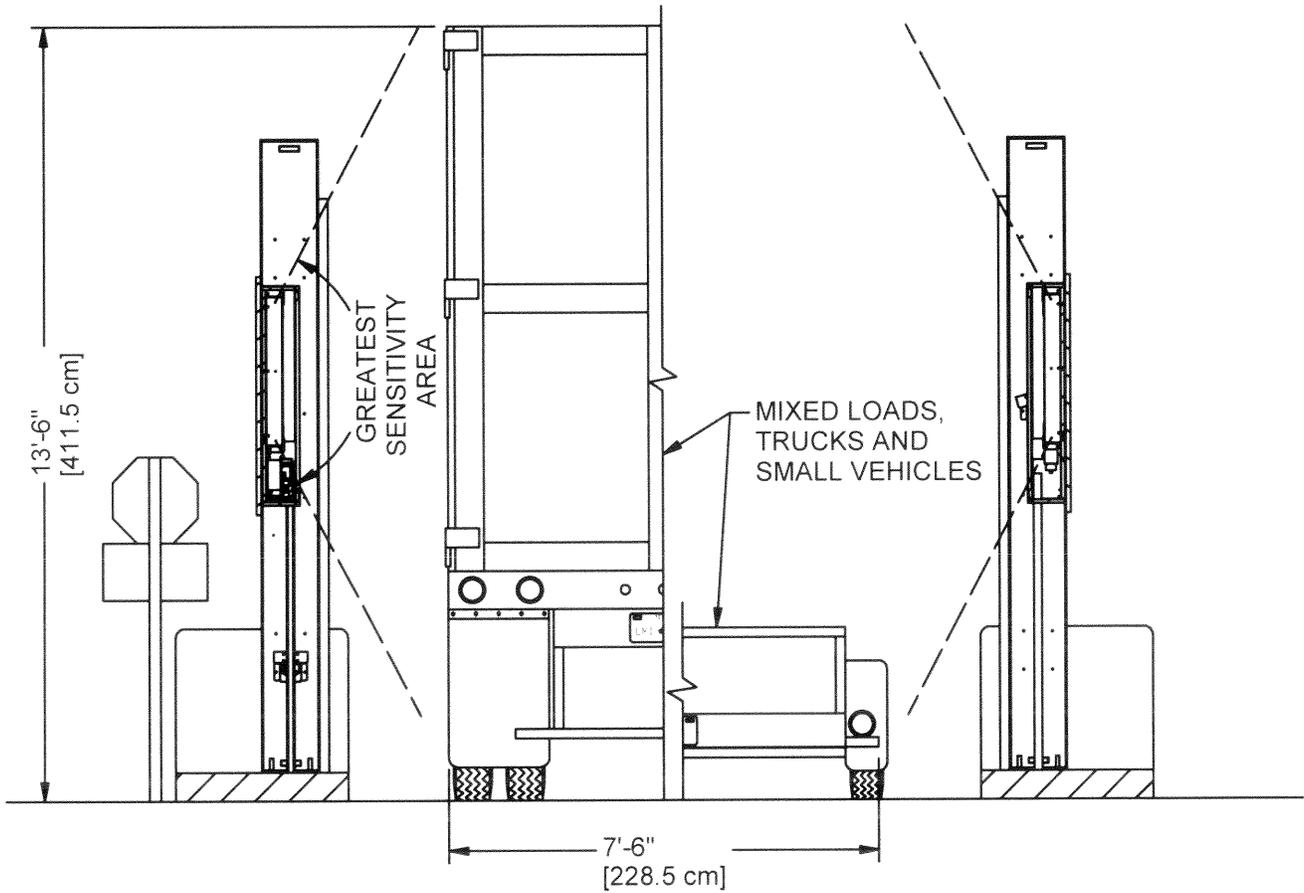
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2-12-18	JGW
2	ECF 2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM



ALL DIMENSIONS ARE SUBJECT TO CHANGE  
DEPENDING ON SITE REQUIREMENTS OR  
LOCAL CODES.

DWN ZJM	DATE 11/30/2020	CHK	DATE	APP JGW	DATE 11-30-20
<b>DWG NUM: 4517-009</b>				SCALE: --	
<b>TITLE M 4525-5K POST HOLE STAND</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 517	SHEET 9F	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	10-21-19	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM



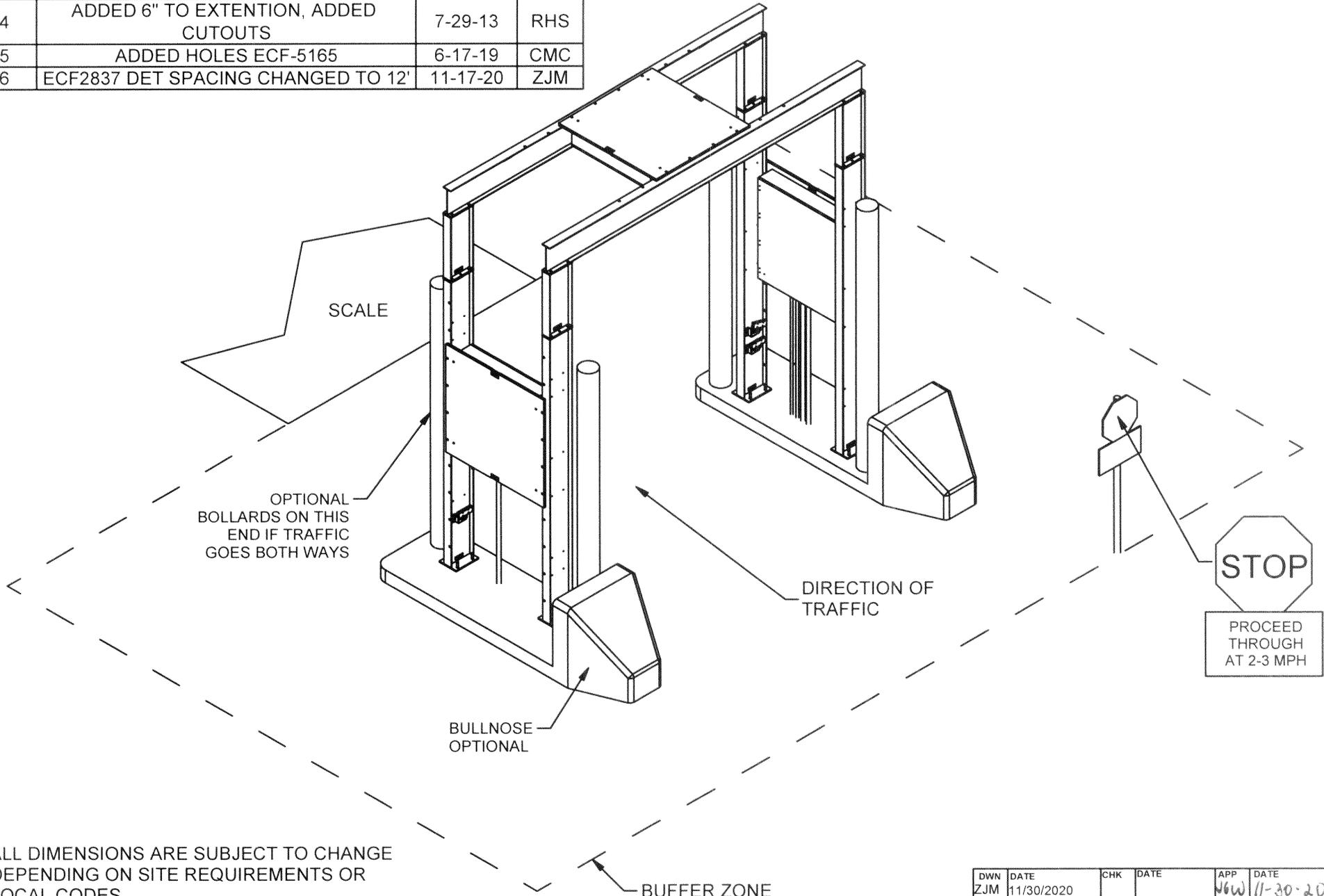
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

**SENSITIVITY NOTE:**  
 AREA SHOWN IS THE GREATEST SENSITIVITY AREA. THE SYSTEM WILL DETECT RADIATION OUTSIDE OF THAT AREA, BUT WITH REDUCED SENSITIVITY.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/2/2020			<i>NW</i>	12-2-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5000 SENSITIVE AREA</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928B	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
3	UPDATED SENSOR HEIGHT DIMENSION	5-31-13	MCK
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM

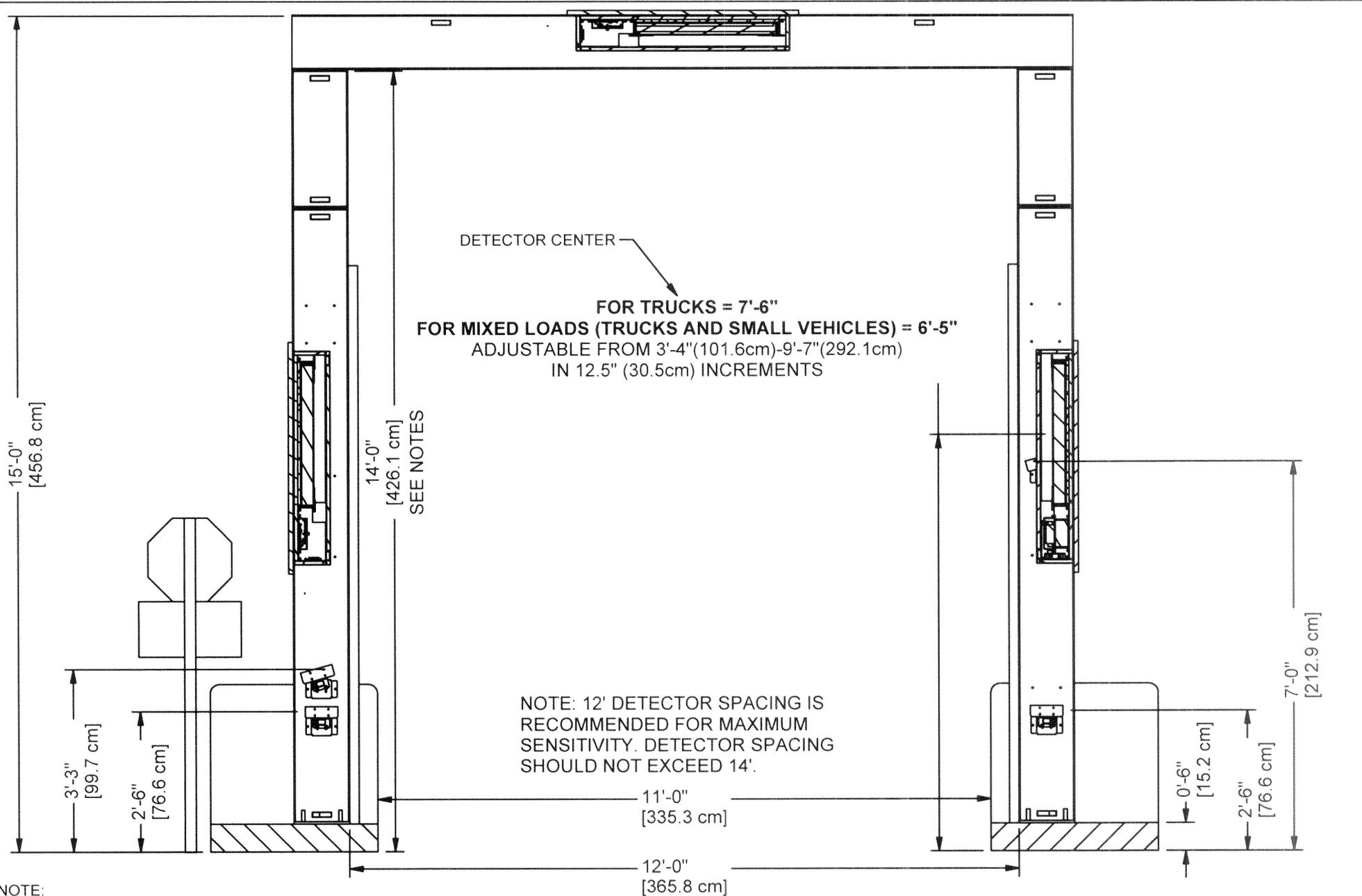


ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

SEE SHEET 928Q FOR CONCRETE DETAILS AND 928R-928V FOR STAND DETAILS.

BUFFER ZONE (SEE SHEET 511 X 928J)

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			J6W	11-30-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-7500 TYPICAL INSTALLATION</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928C	

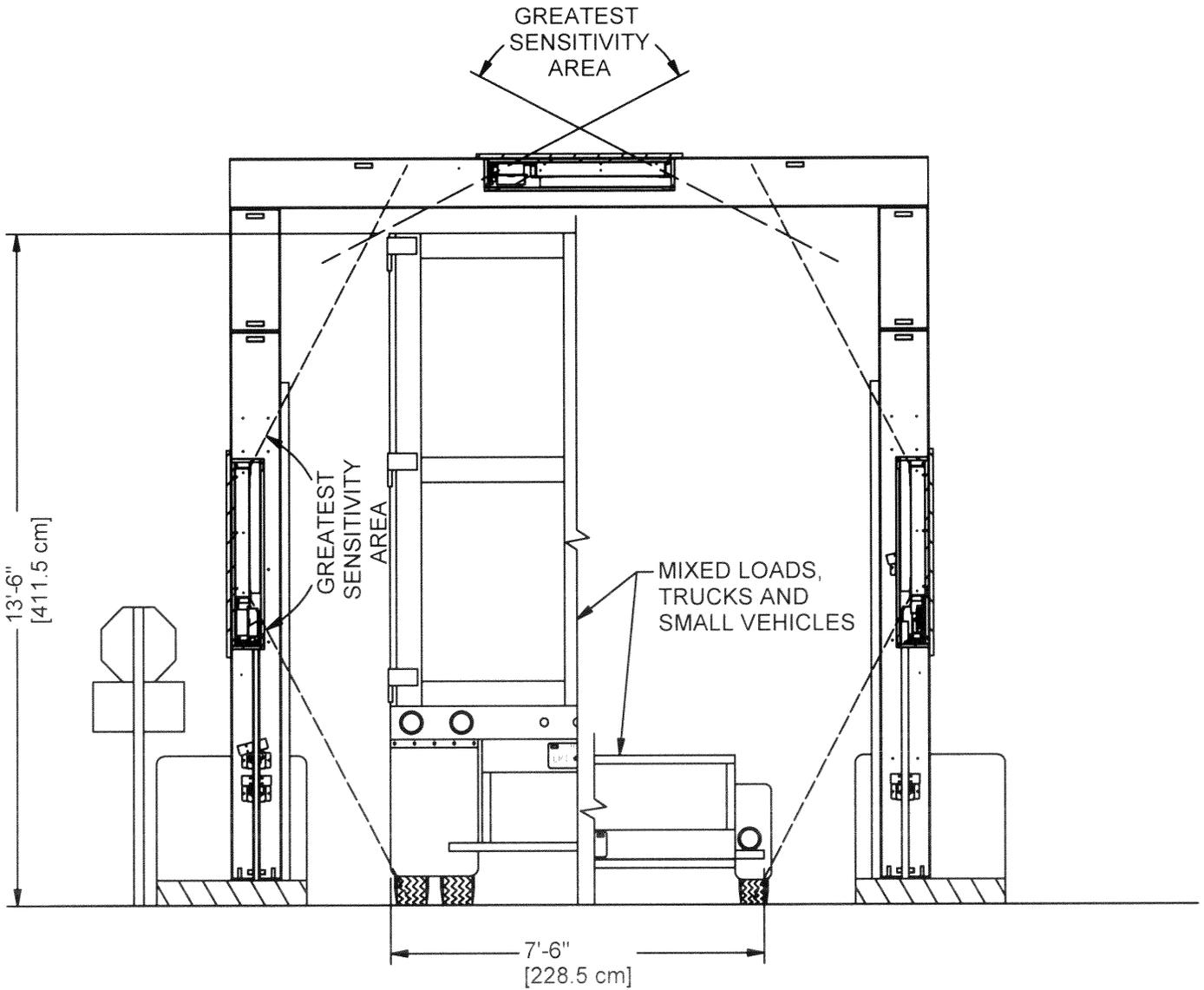


NOTE:  
 IN AREAS THAT ARE SUBJECT TO HEAVY ICE/SNOW BUILDUP, CURB HEIGHT MAY NEED TO BE INCREASED FOR EXTRA CLEARANCE FOR OVERHEAD.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

REVISION HISTORY				DWN	DATE	CHK	DATE	APP	DATE
REV	DESCRIPTION	DATE	BY	ZJM	11/30/2020			J6w	11-30-20
5	ADDED HOLES ECF-5165	6-17-19	CMC	<b>DWG NUM: 4511-928</b>				SCALE: --	
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM	<b>TITLE M 4525-7500 DETECTOR ELEVATION</b>				SERIES	SHEET
				LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556				511	928D

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	4-6-20	CMC
2	ECF2837 DET SPACING CHANGED TO 12'	12-2-20	ZJM

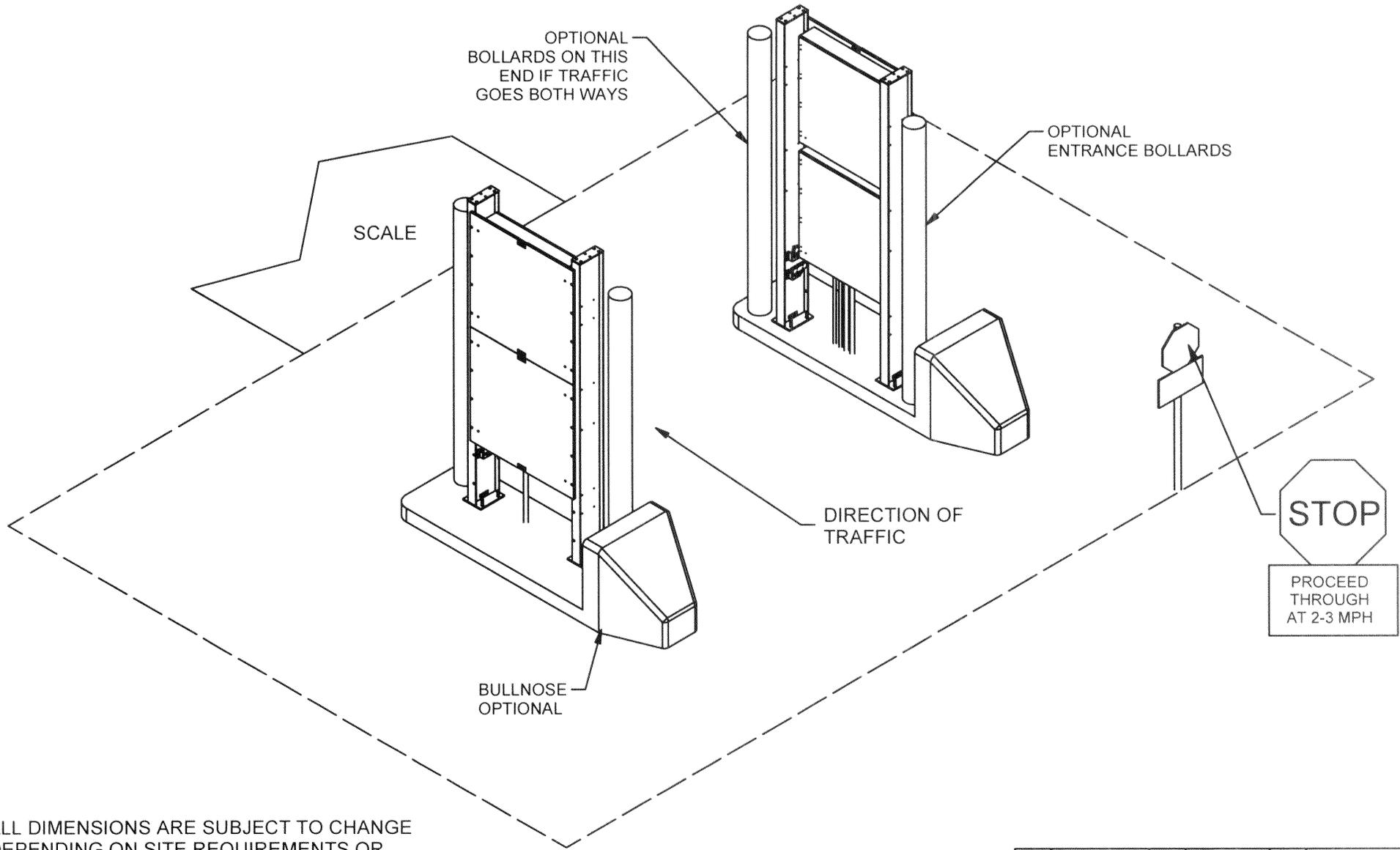


**SENSITIVITY NOTE:**  
 AREA SHOWN IS THE GREATEST SENSITIVITY AREA. THE SYSTEM WILL DETECT RADIATION OUTSIDE OF THAT AREA, BUT WITH REDUCED SENSITIVITY.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/2/2020			<i>ZJM</i>	12-2-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-7500 SENSITIVE AREA</b>					
LUDLUM MEASUREMENTS, INC. 901 OAK STREET SWEETWATER, TEXAS 79556				SERIES 511	SHEET 928E

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

SEE SHEET 928Q FOR CONCRETE DETAILS AND 928R-928V FOR STAND DETAILS.

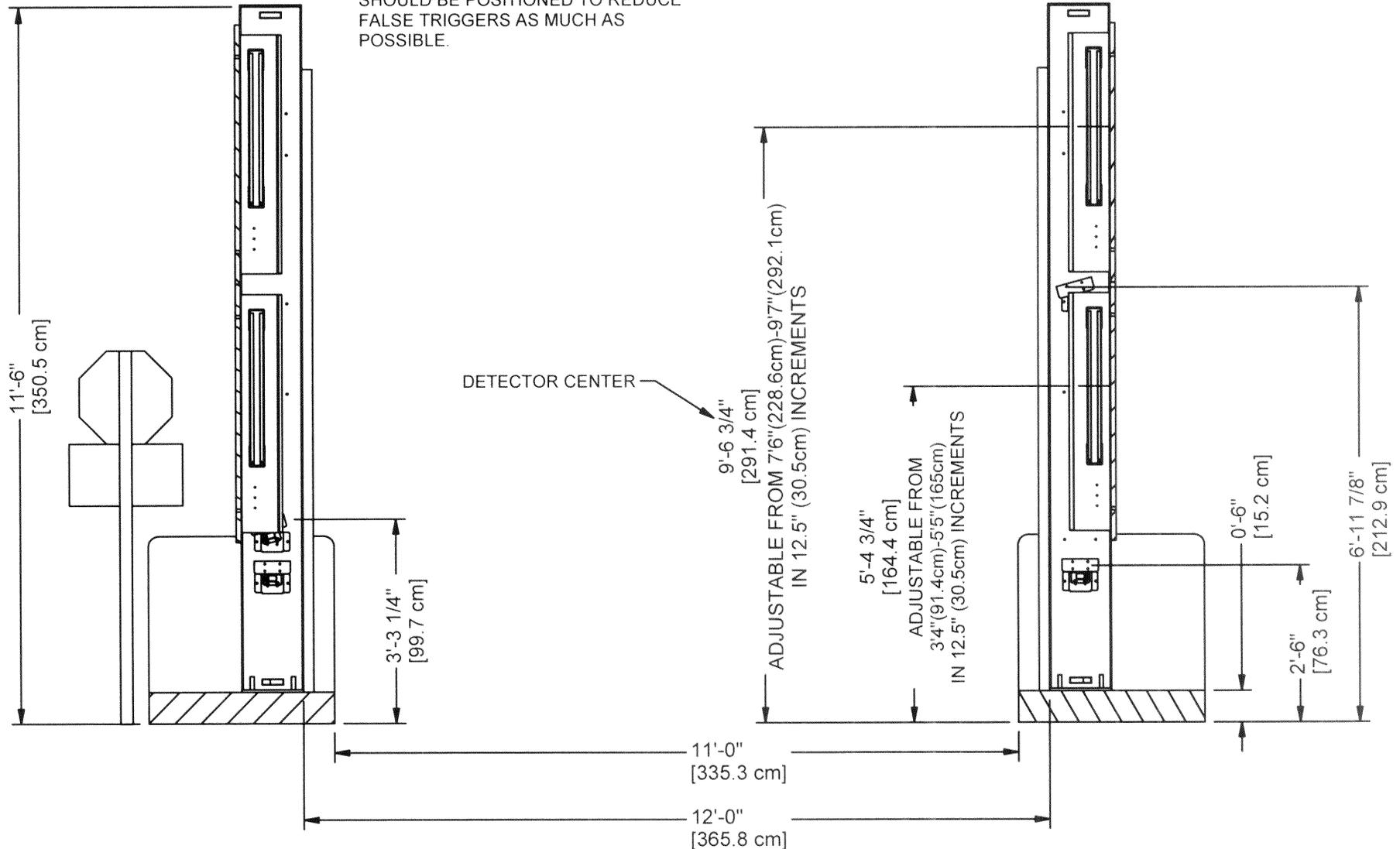
DWN ZJM	DATE 11/30/2020	CHK	DATE	APP Jsw	DATE 11-30-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-10K TYPICAL INSTALLATION</b>					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 928F		

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM

**NOTE:**

IF SYSTEM IS BEING USED EXCLUSIVELY FOR TRAINS OR LARGE TRUCKS, DETECTOR HEIGHT SHOULD BE RAISED SO THAT DETECTORS ARE CENTERED ON THE SIDE OF THE RAIL CAR OR TRUCK BED. IR SENSORS SHOULD BE POSITIONED TO REDUCE FALSE TRIGGERS AS MUCH AS POSSIBLE.



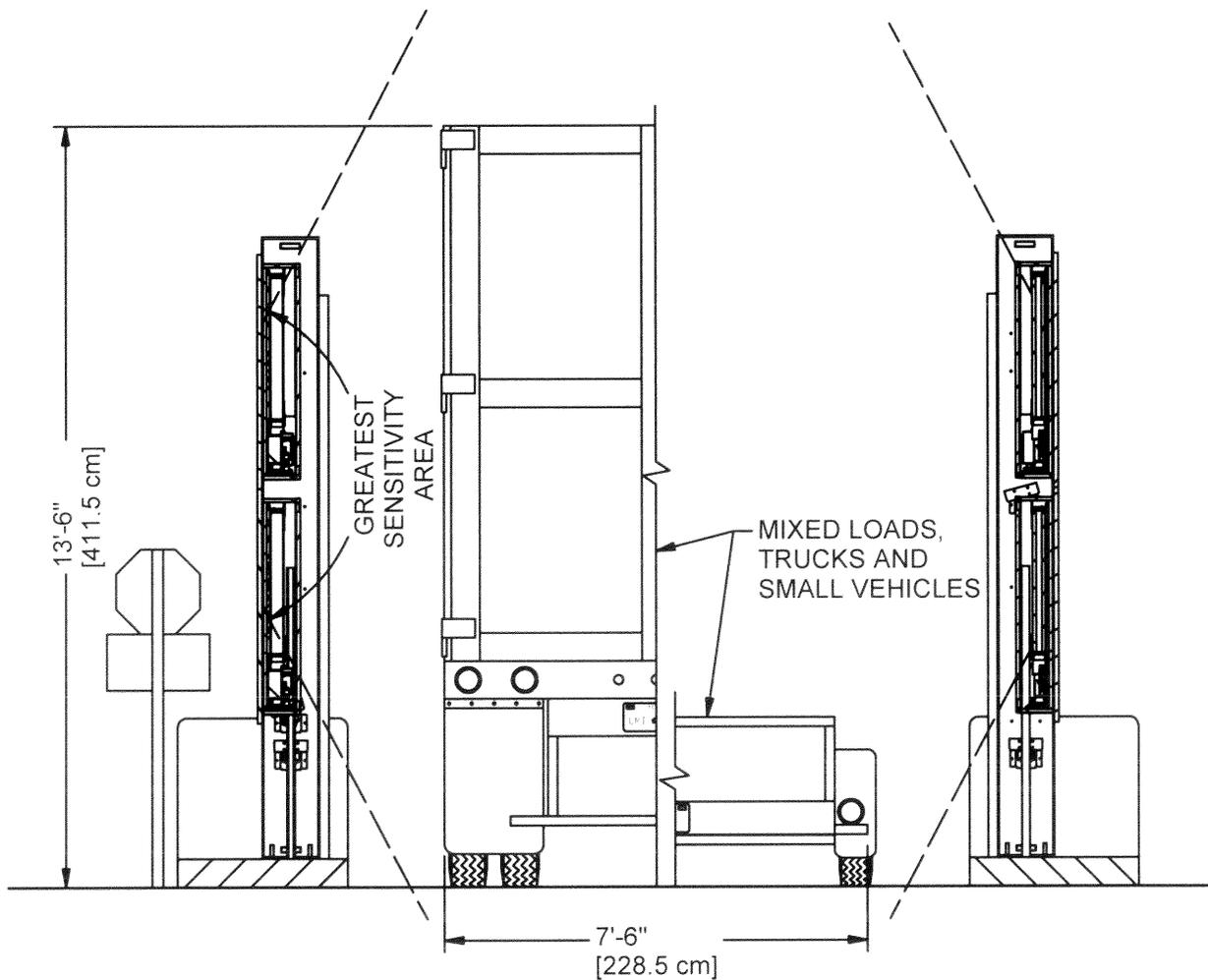
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

NOTE: 12' DETECTOR SPACING IS RECOMMENDED FOR MAXIMUM SENSITIVITY. DETECTOR SPACING SHOULD NOT EXCEED 14'.

DWN ZJM	DATE 12/1/2020	CHK	DATE	APP Nbw	DATE 12-1-20
<b>DWG NUM:</b> 4511-928				<b>SCALE:</b> --	
<b>TITLE</b> M 4525-10K DETECTOR ELEVATION					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928G	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	10-21-19	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-25-20	ZJM

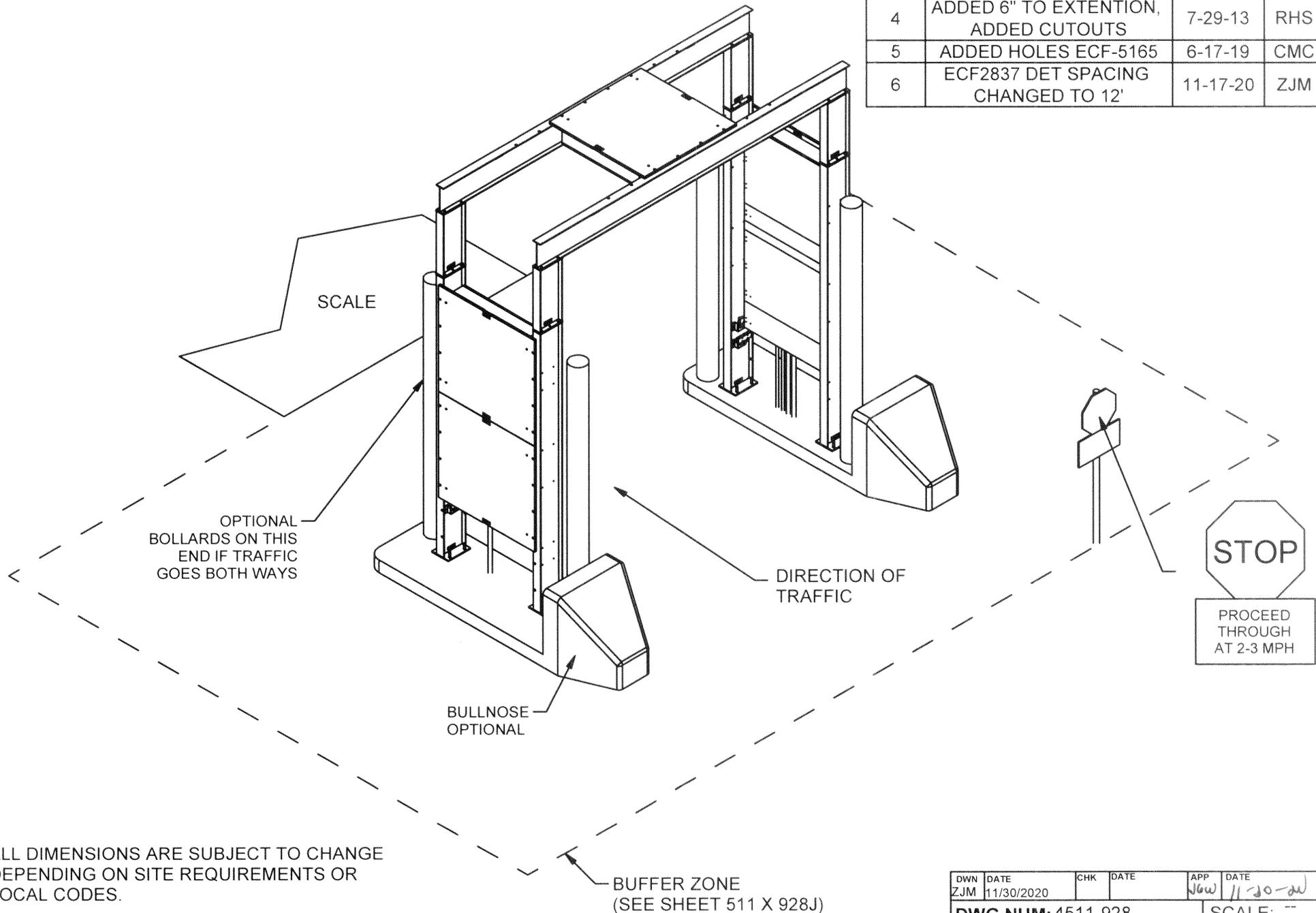


ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SENSITIVITY NOTE:  
AREA SHOWN IS THE GREATEST SENSITIVITY AREA. THE SYSTEM WILL DETECT RADIATION OUTSIDE OF THAT AREA, BUT WITH REDUCED SENSITIVITY.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/2/2020			Jew	12-2-20
<b>DWG NUM: 4511-928</b>				<b>SCALE: --</b>	
<b>TITLE M 4525-10000 SENSITIVE AREA</b>					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		<b>SERIES</b> 511		<b>SHEET</b> 928H	

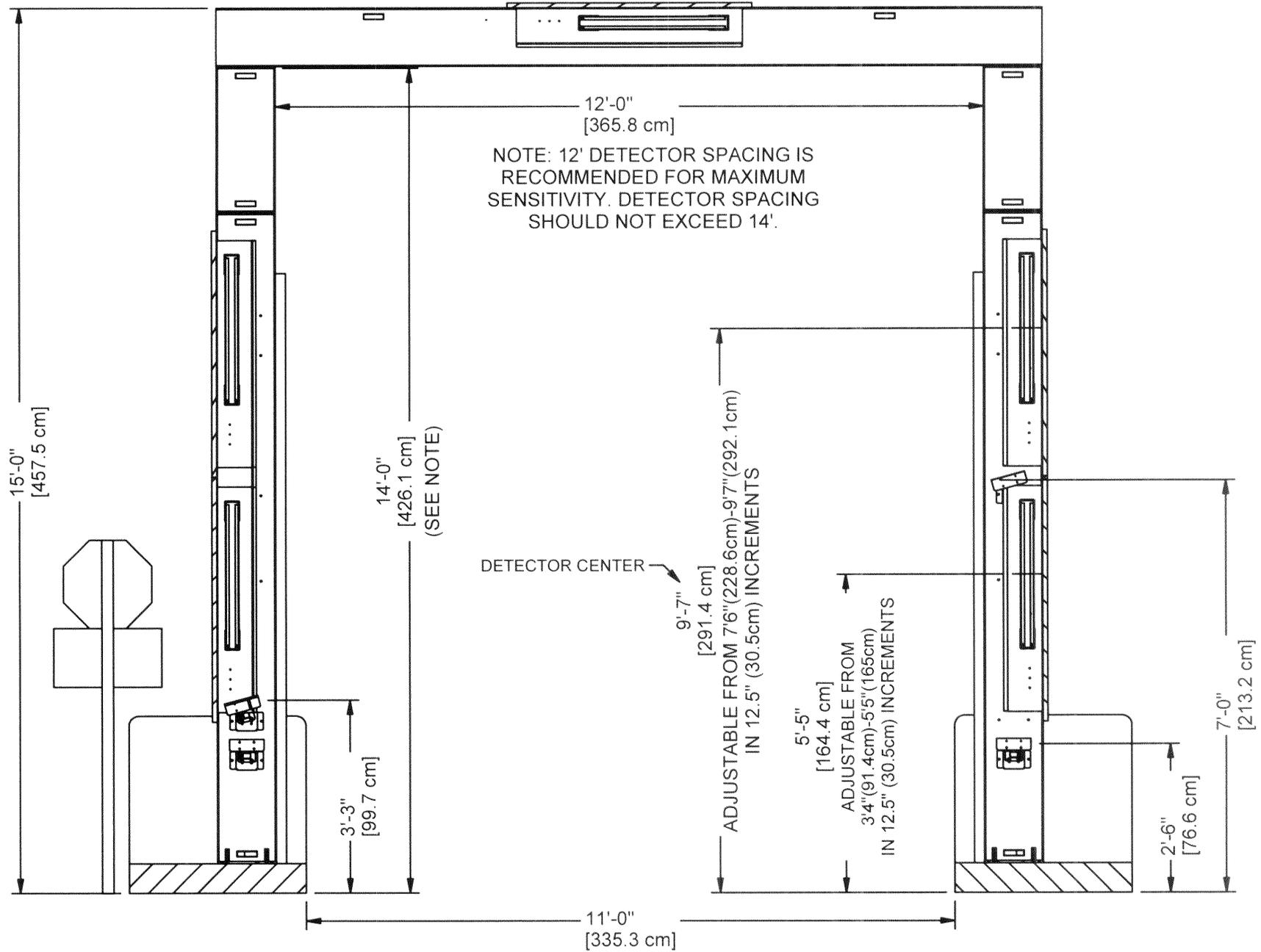
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

SEE SHEET 928Q FOR CONCRETE DETAILS AND 928R-928V FOR STAND DETAILS.

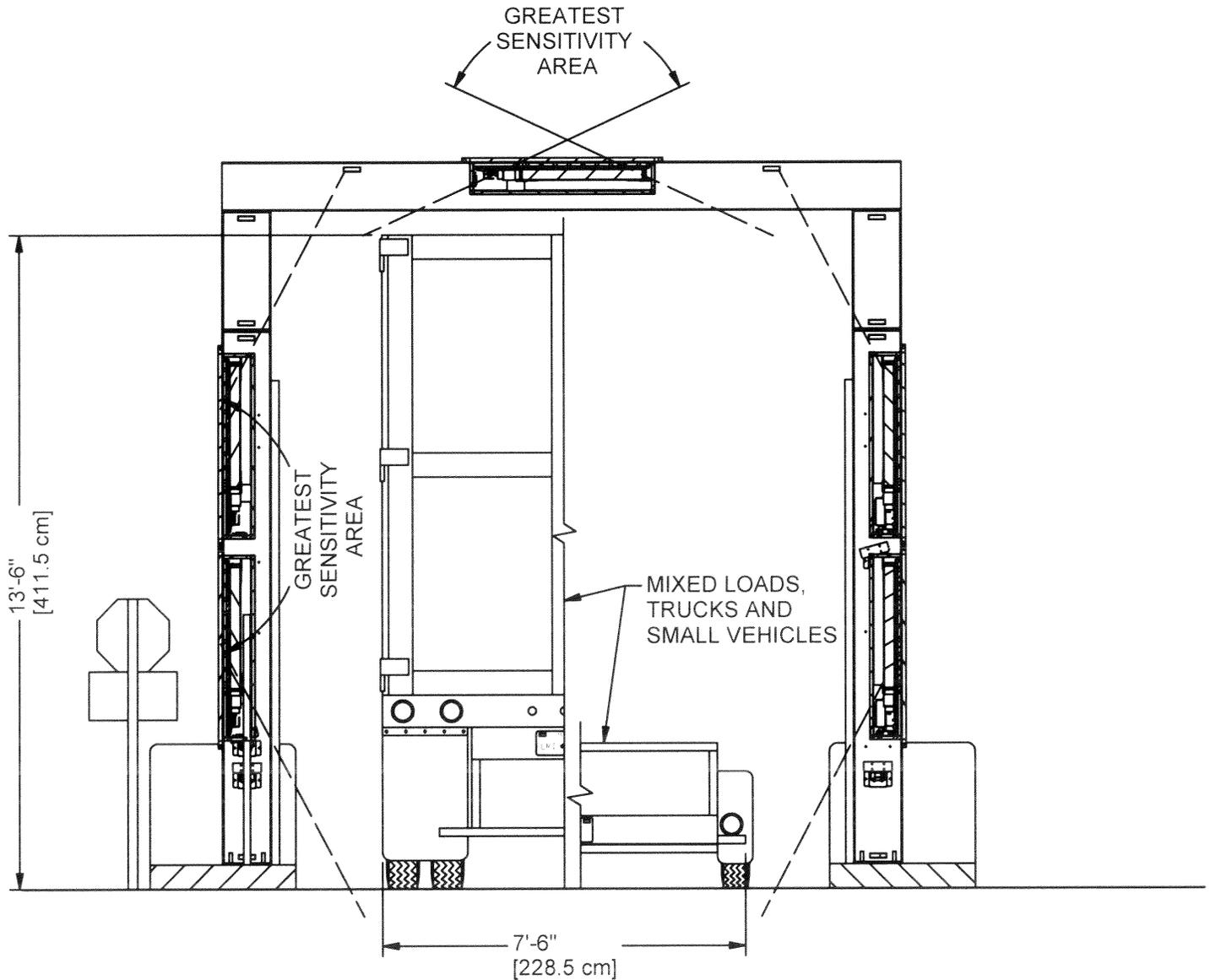
DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			Jaw	11-30-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-12500 TYPICAL INSTALLATION</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 928I		



NOTE:  
 IN AREAS THAT ARE SUBJECT TO HEAVY ICE/SNOW BUILDUP, CURB HEIGHT MAY NEED TO BE INCREASED FOR EXTRA CLEARANCE FOR OVERHEAD.  
 ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

REVISION HISTORY				DWN	DATE	CHK	DATE	APP	DATE
REV	DESCRIPTION	DATE	BY	ZJM	11/30/2020			Jew	11-30-20
5	ADDED HOLES ECF-5165	6-17-19	CMC	<b>DWG NUM: 4511-928</b>				SCALE: --	
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM	<b>TITLE M 4525-12500 DETECTOR ELEVATION</b>				SERIES 511	SHEET 928J
				LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556					

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM

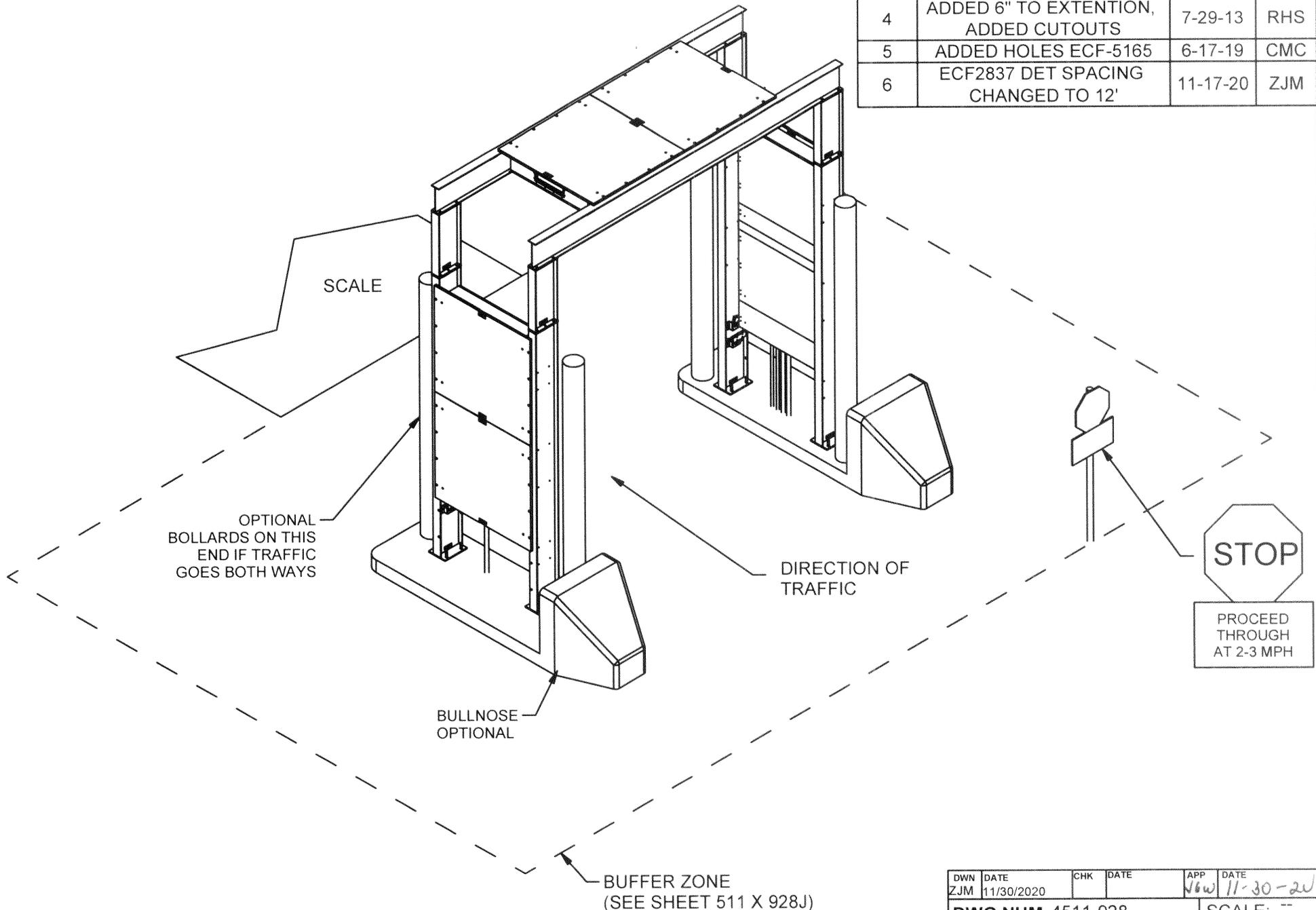


ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SENSITIVITY NOTE:  
 AREA SHOWN IS THE GREATEST SENSITIVITY AREA. THE SYSTEM WILL DETECT RADIATION OUTSIDE OF THAT AREA, BUT WITH REDUCED SENSITIVITY.

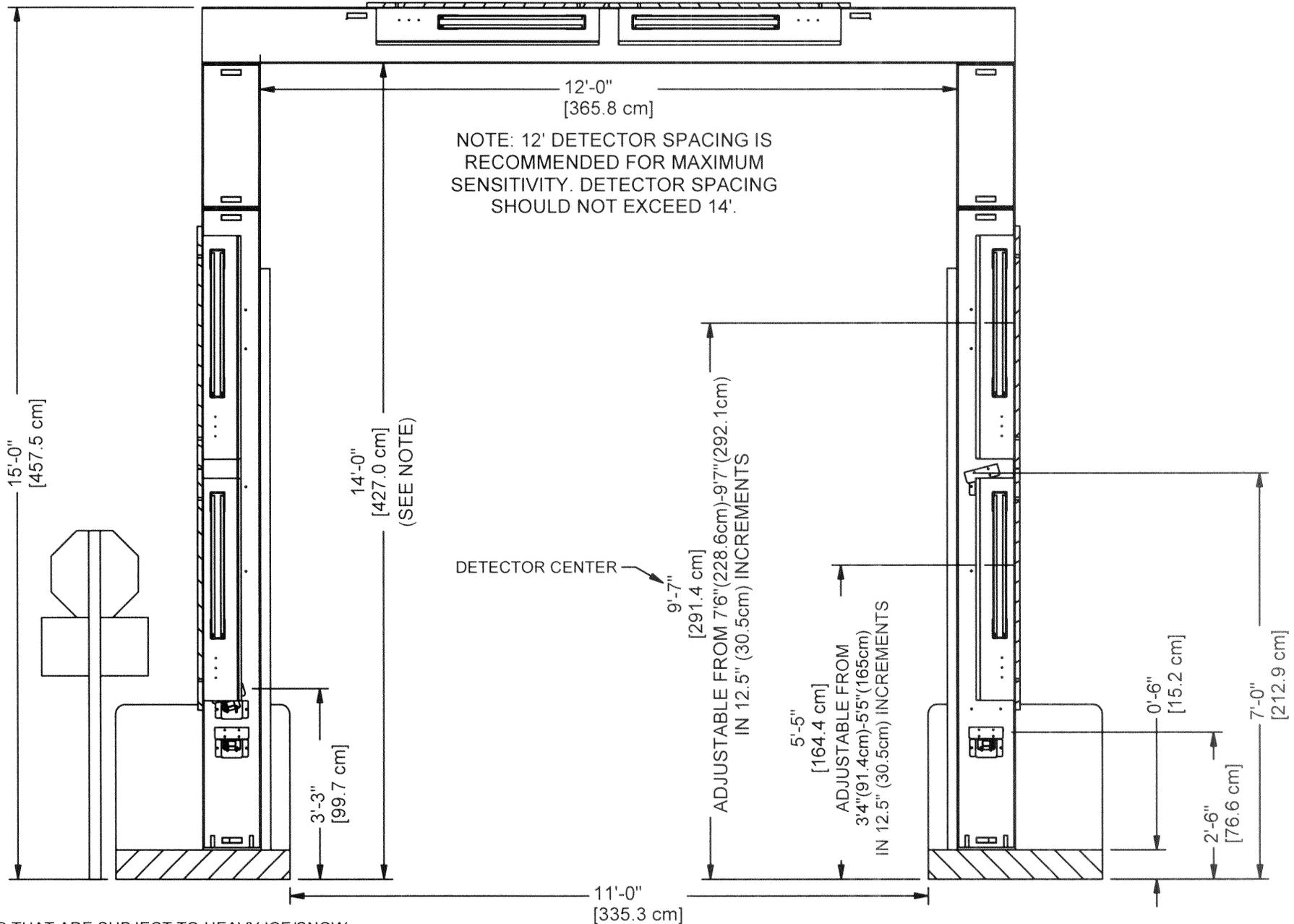
DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/2/2020			<i>ZJM</i>	12-2-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-12500 SENSITIVE AREA</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556				SERIES 511	SHEET 928K

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/30/2020			<i>JW</i>	11-30-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-15K TYPICAL INSTALLATION</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			511	928L	

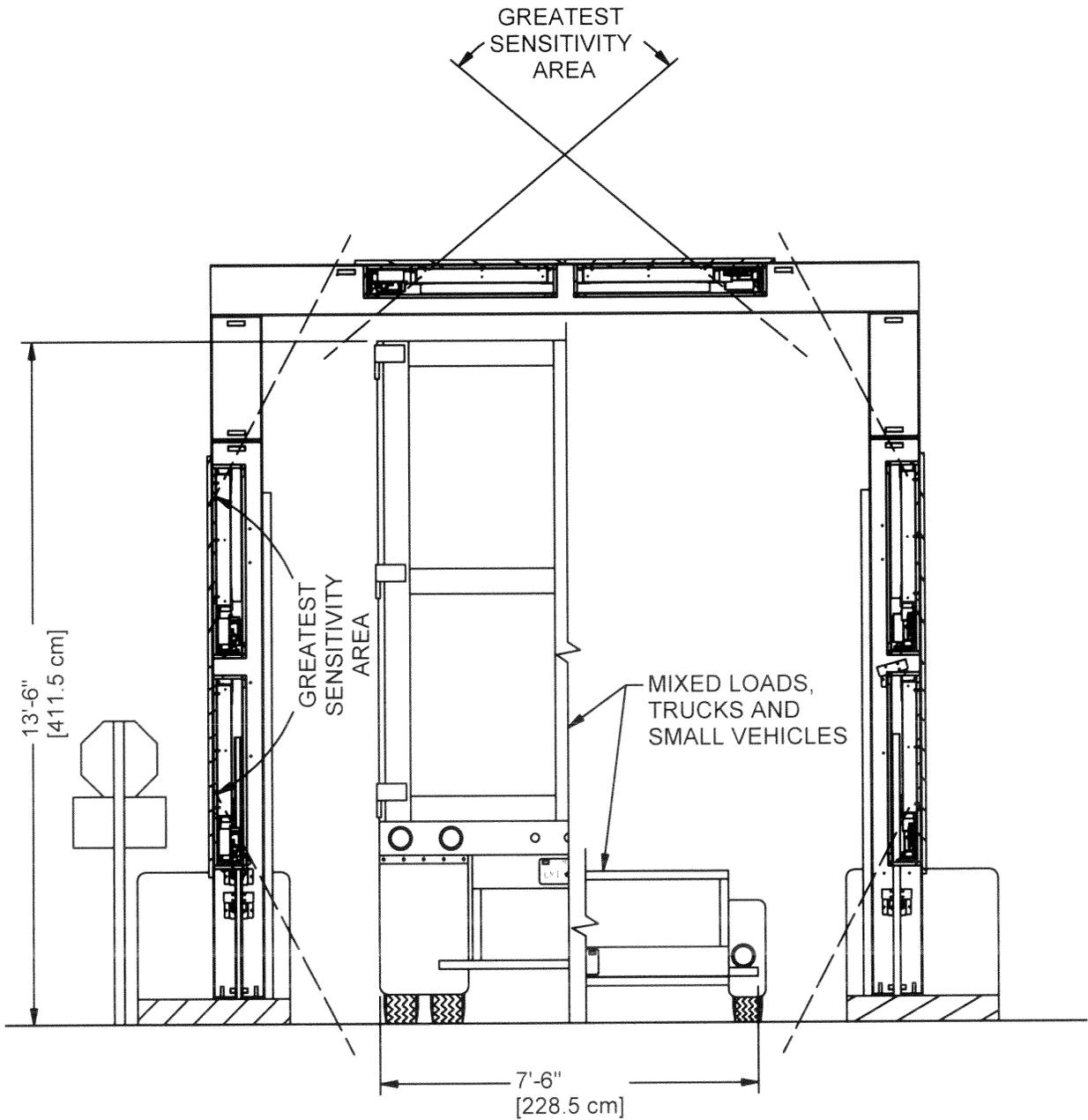


NOTE:  
IN AREAS THAT ARE SUBJECT TO HEAVY ICE/SNOW BUILDUP, CURB HEIGHT MAY NEED TO BE INCREASED FOR EXTRA CLEARANCE FOR OVERHEAD.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

REVISION HISTORY				DWN	DATE	CHK	DATE	APP	DATE
REV	DESCRIPTION	DATE	BY	ZJM	11/30/2020			Jaw	11-30-20
5	ADDED HOLES ECF-5165	6-17-19	CMC	DWG NUM: 4511-928				SCALE: --	
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM	TITLE M 4525-15K DETECTOR ELEVATION				SERIES 511	SHEET 928M
				LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556					

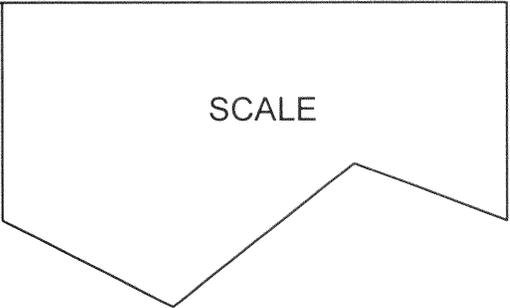
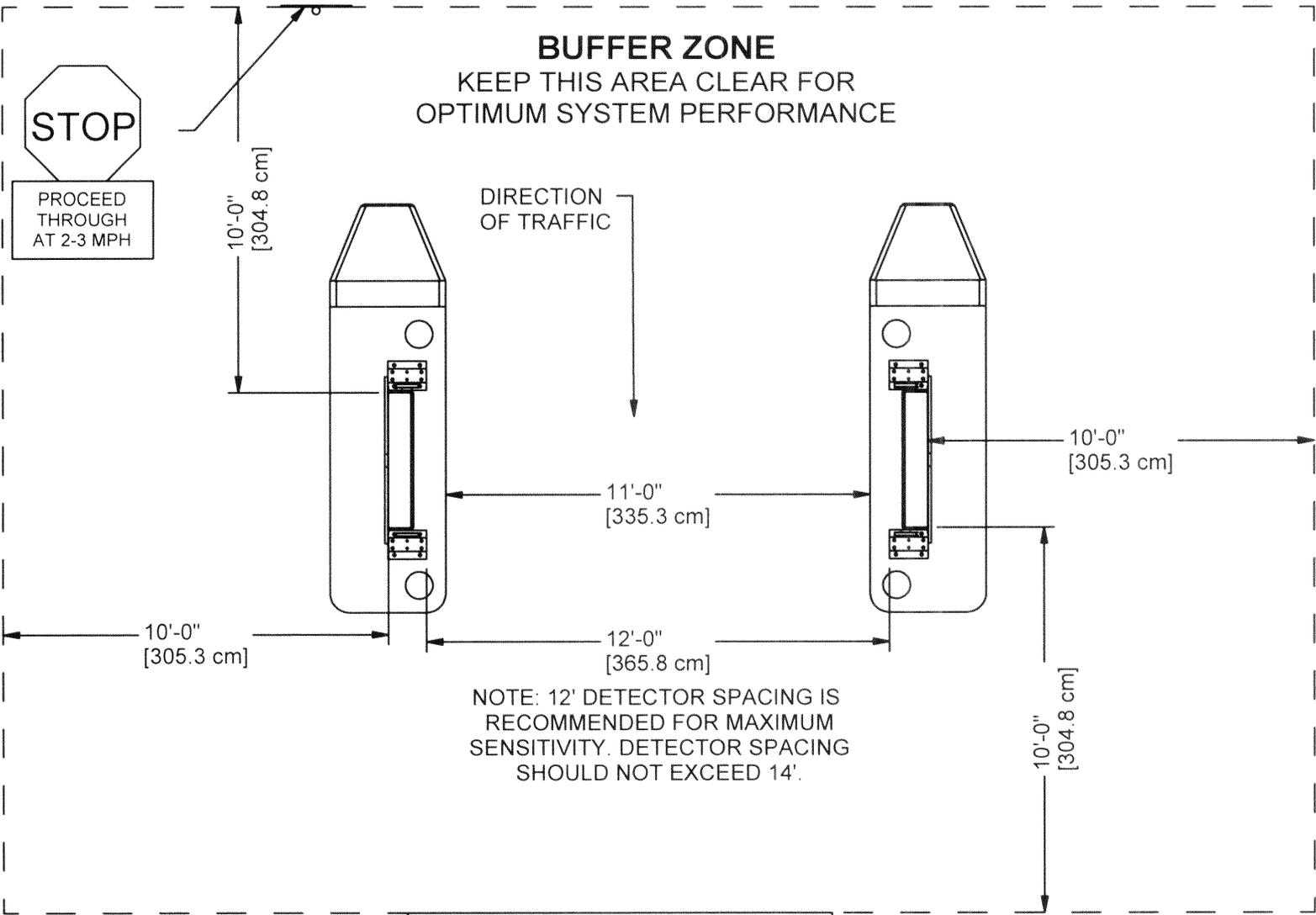
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	10-21-19	CMC
2	ECF2837 DET SPACING CHANGED TO 12'	11-30-20	ZJM



**SENSITIVITY NOTE:**  
 AREA SHOWN IS THE GREATEST SENSITIVITY AREA. THE SYSTEM WILL DETECT RADIATION OUTSIDE OF THAT AREA, BUT WITH REDUCED SENSITIVITY.

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

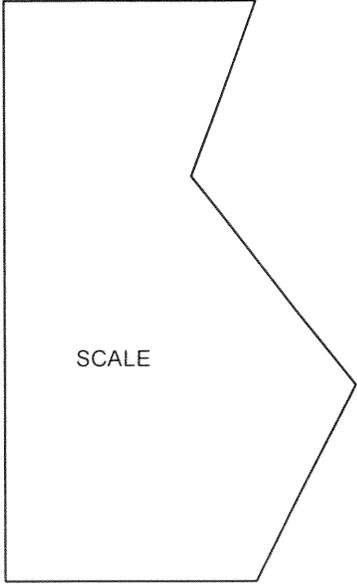
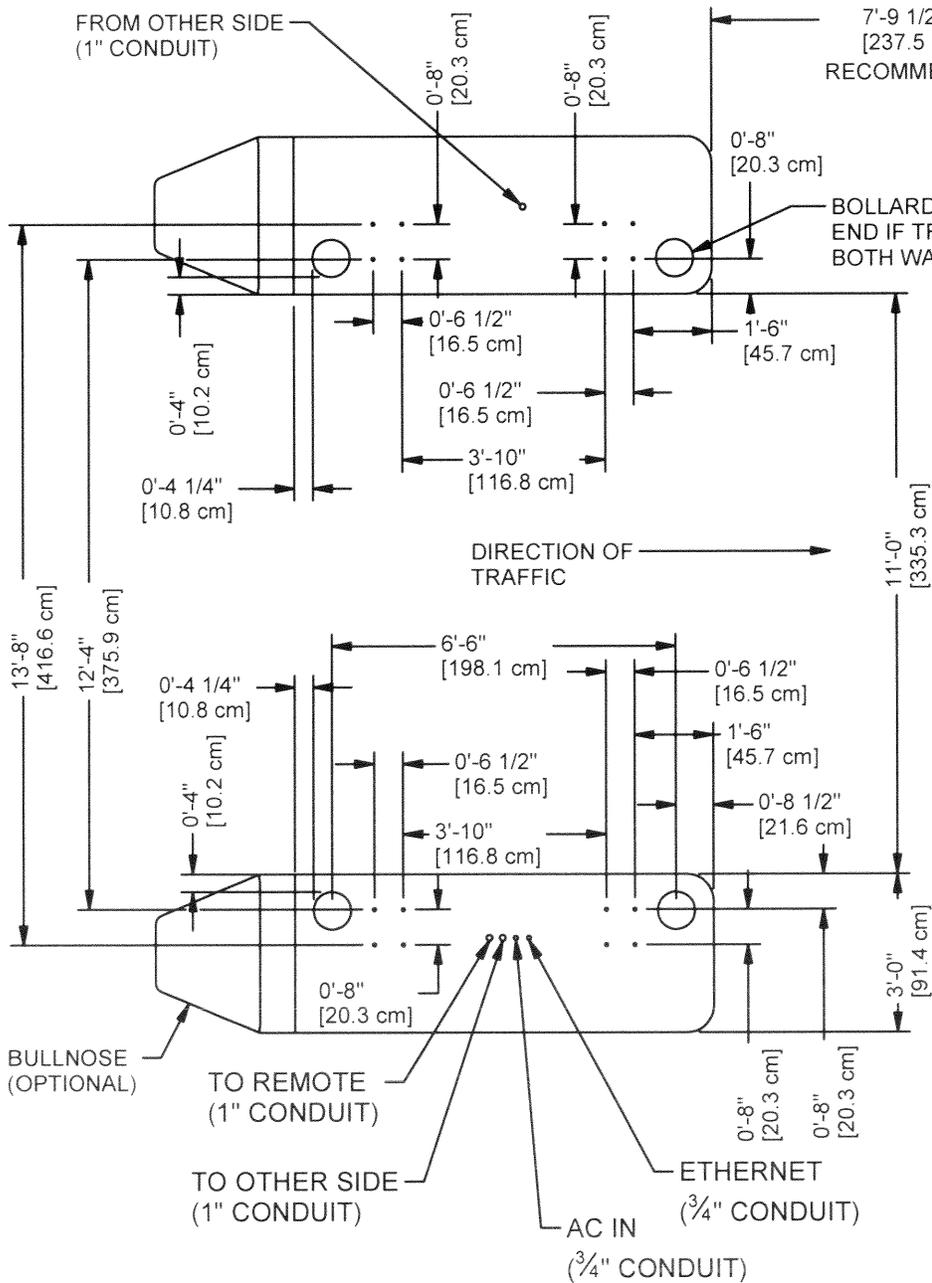
DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/2/2020			J6W	12-2-20
<b>DWG NUM: 4511-928</b>				<b>SCALE: --</b>	
<b>TITLE M 4525-15000 SENSITIVE AREA</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			<b>SERIES</b> 511	<b>SHEET</b> 928N	



ALL DIMENSIONS ARE SUBJECT TO CHANGE  
DEPENDING ON SITE REQUIREMENTS OR  
LOCAL CODES.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM

DWN ZJM	DATE 12/1/2020	CHK	DATE	APP Now	DATE 12-1-20
<b>DWG NUM:</b> 4511-928				<b>SCALE:</b> --	
<b>TITLE</b> M 4525-5000 AERIAL VIEW					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		<b>SERIES</b> 511	<b>SHEET</b> 928P		

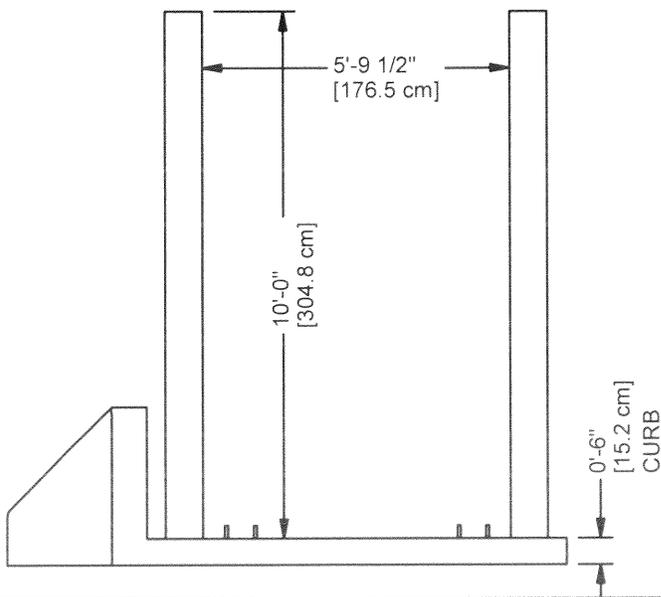


SEE SHEET 511 X 836(A) FOR CONCRETE AND ANCHOR BOLT DETAILS.

BOLLARDS ARE 8" PIPE OR SIMILAR, FILLED WITH CONCRETE (NOT SUPPLIED)

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

SEE DETECTOR ELEVATION SHEETS FOR DETECTOR SPACING.



REVISION HISTORY					
REV	DESCRIPTION	DATE	BY	DWN	DATE
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS	ZJM	12/1/2020
5	ADDED HOLES ECF-5165	6-17-19	CMC		
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM		

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/1/2020			Jow	12-1-20

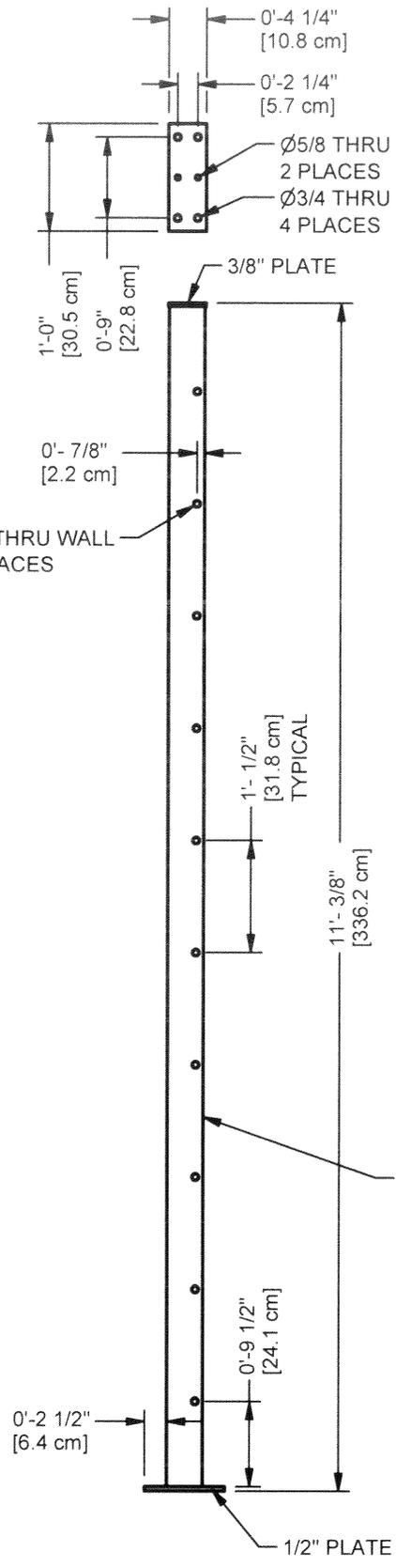
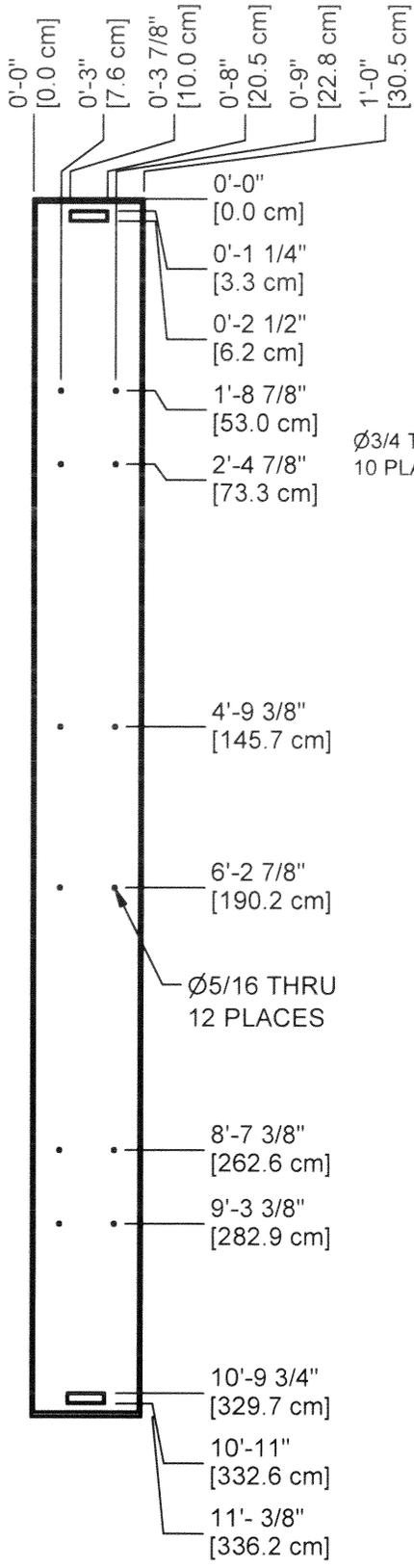
**DWG NUM:** 4511-928      **SCALE:** --

**TITLE** 4525-5000 PLAN VIEW

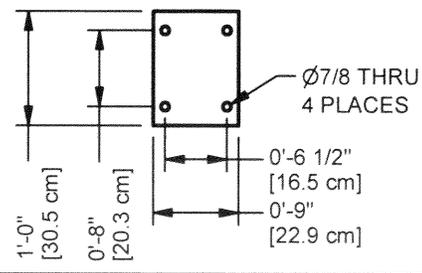
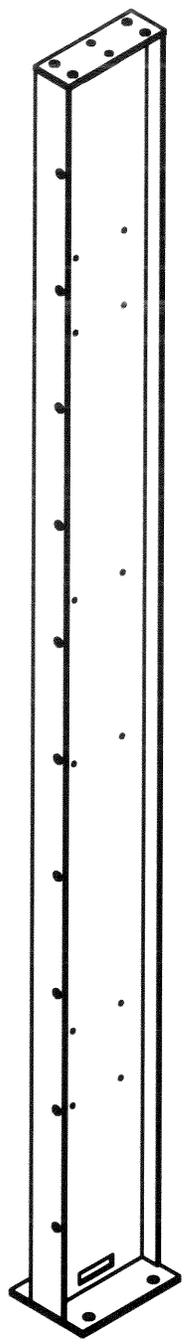
	LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556	SERIES 511	SHEET 928Q
--	--	---------------	---------------

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



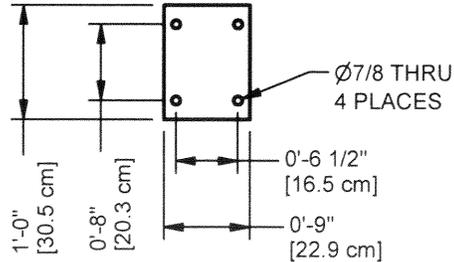
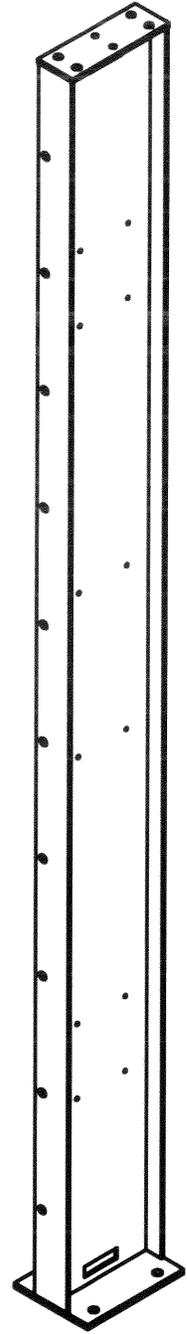
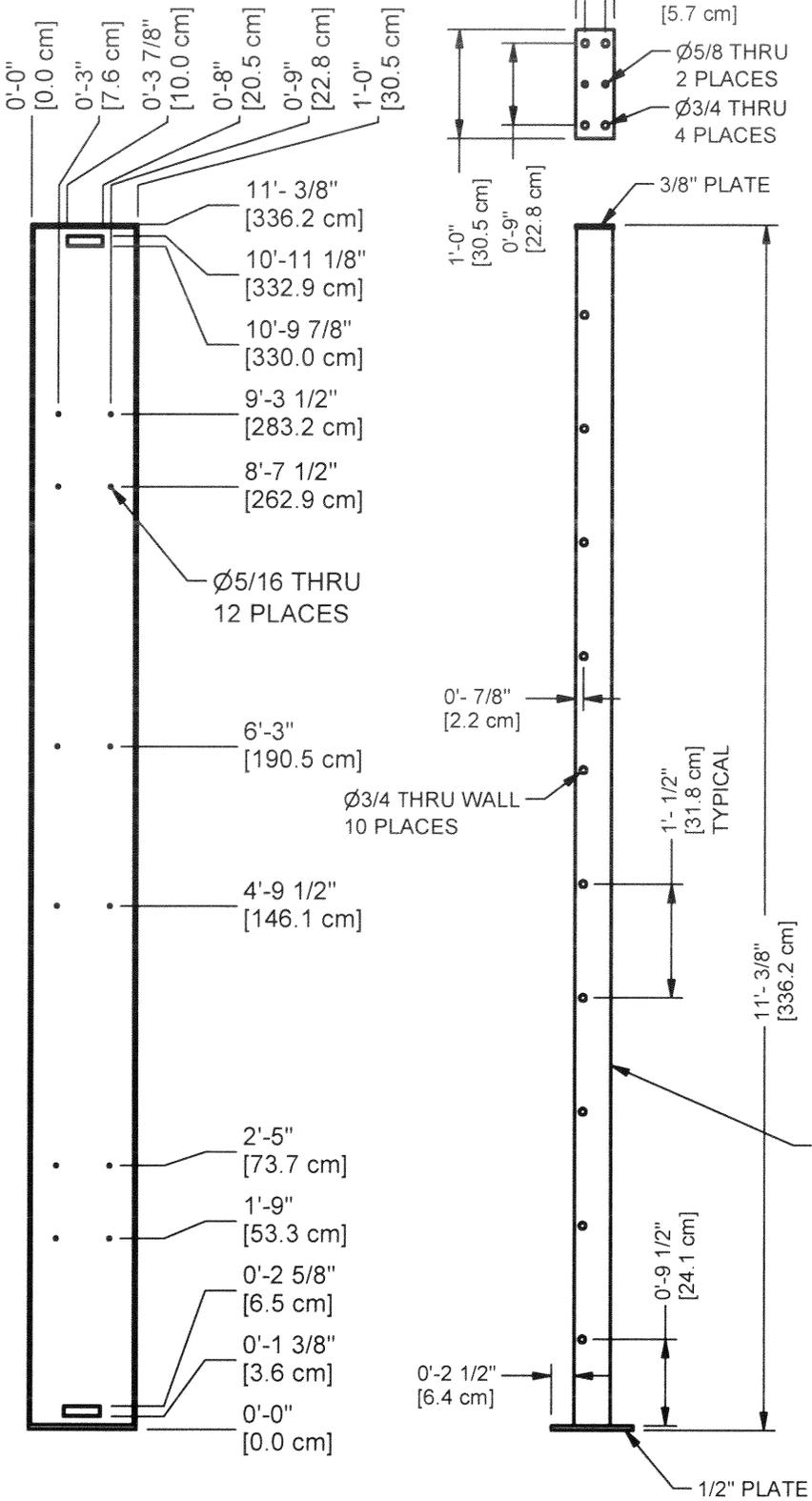
W12 X 16#  
 "I" BEAM  
 IMPERIAL  
 (12" X 4" X 16 LB/FT)  
 METRIC  
 (310mm x 100mm x 23.8 kg/m)



ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/18/2020			New	12-18-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5000 STAND RIGHT LEG</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928R	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM

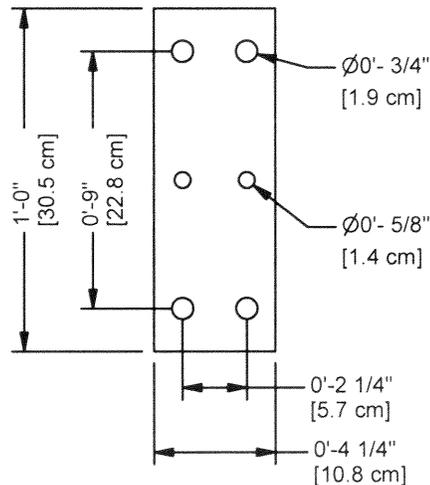
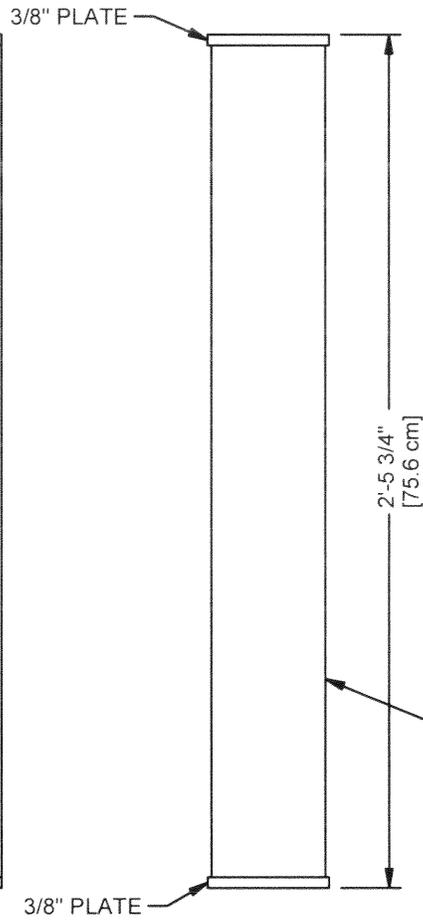
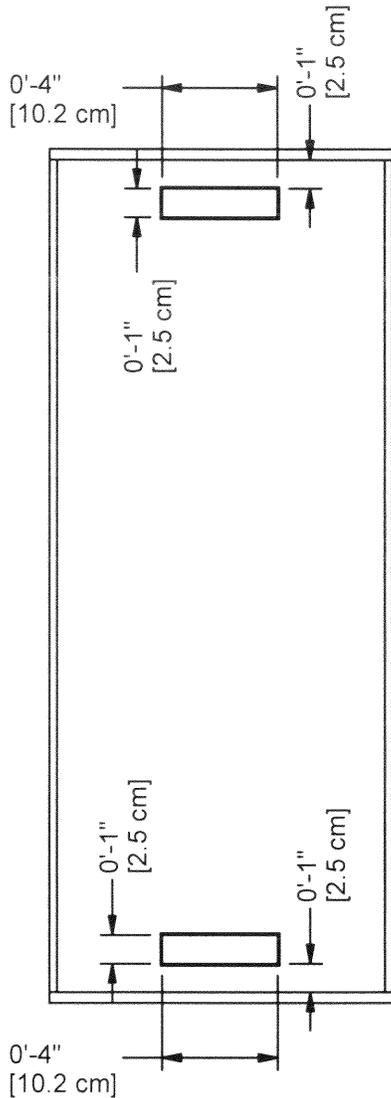
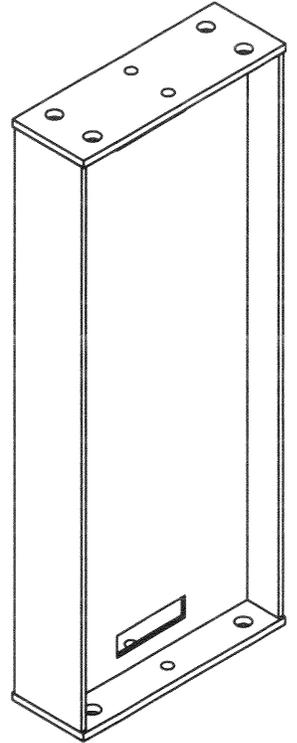
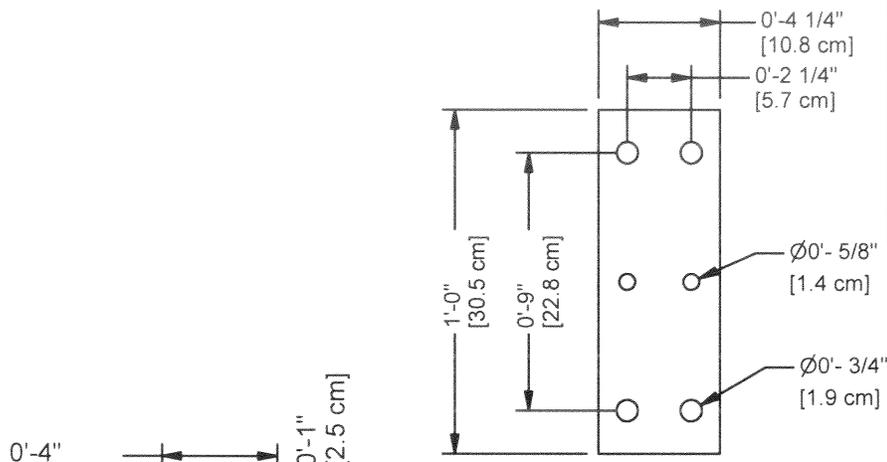


ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/18/2020			Jow	12-18-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5000 STAND LEFT LEG</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928S	

REVISION HISTORY

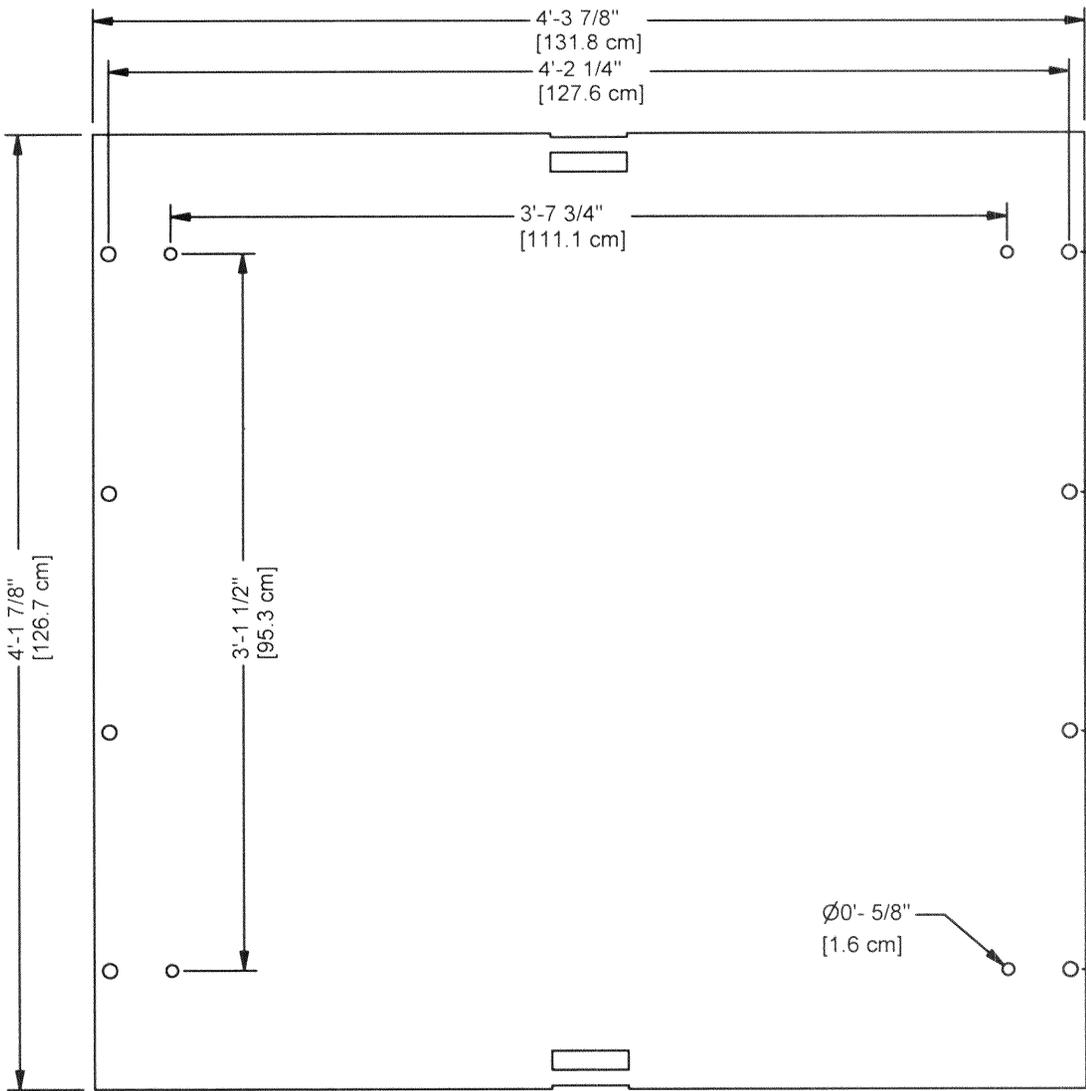
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RH S
5	ADDED HOLES ECF-5165	6-17-19	CM C
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



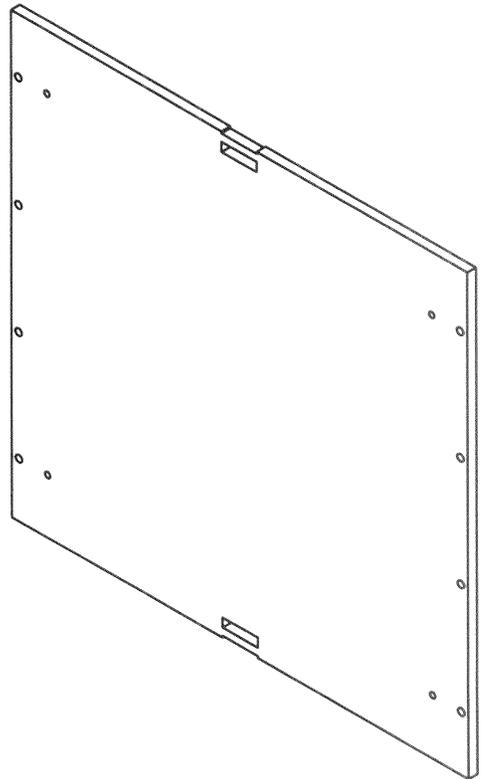
W12 X 16#  
"I" BEAM  
IMPERIAL  
(12" X 4" X 16 LB/FT)  
METRIC  
(310mm x 100mm x 23.8 kg/m)

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS OR LOCAL CODES.

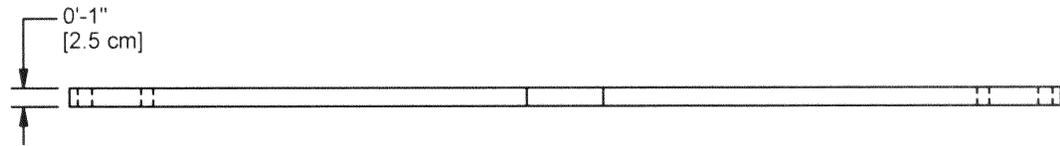
DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/17/2020			JRW	12-17-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5000 STAND EXTENSION</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928T	



REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



Ø0'- 5/8"  
[1.6 cm]

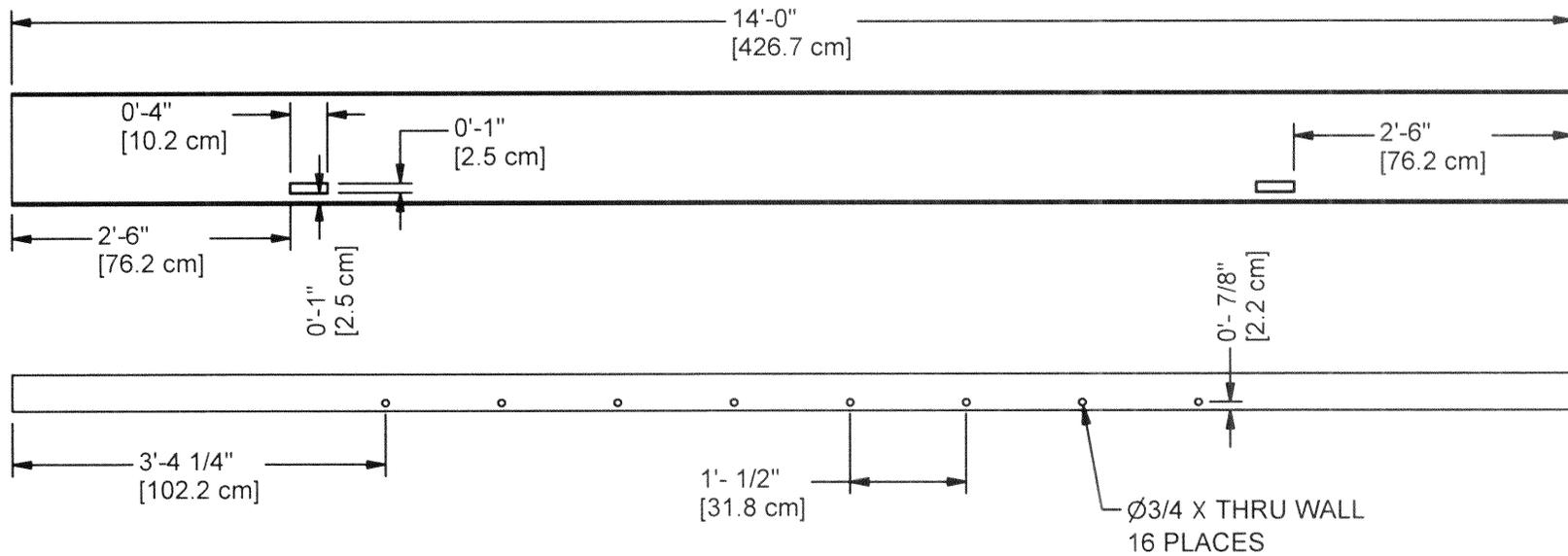
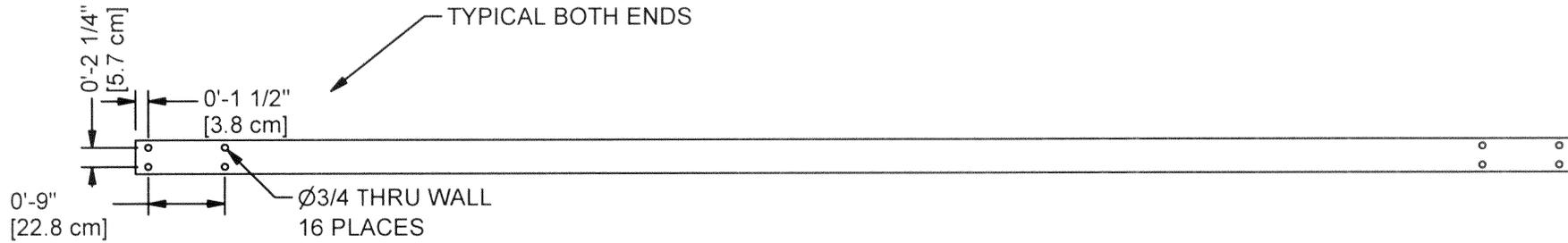


**MATERIAL:**  
**STEEL**

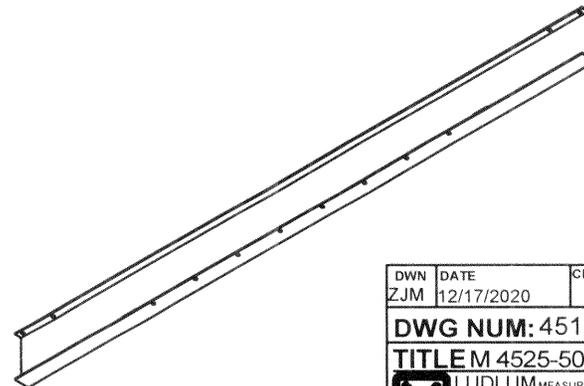
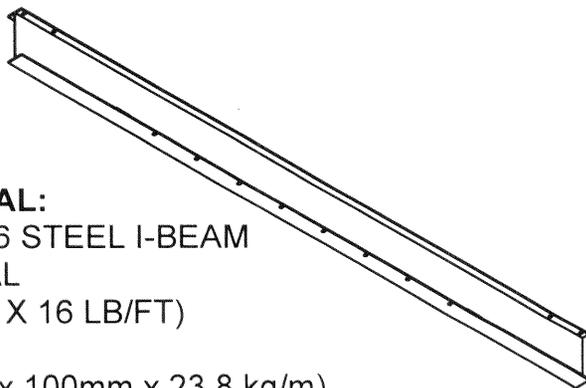
DWN ZJM	DATE 12/1/2020	CHK	DATE	APP JWJ	DATE 12-1-20
<b>DWG NUM:</b> 4511-928				<b>SCALE:</b> --	
<b>TITLE</b> M 4525-5000 STAND BACK PLATE					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		<b>SERIES</b> 511	<b>SHEET</b> 928U		

REVISION HISTORY

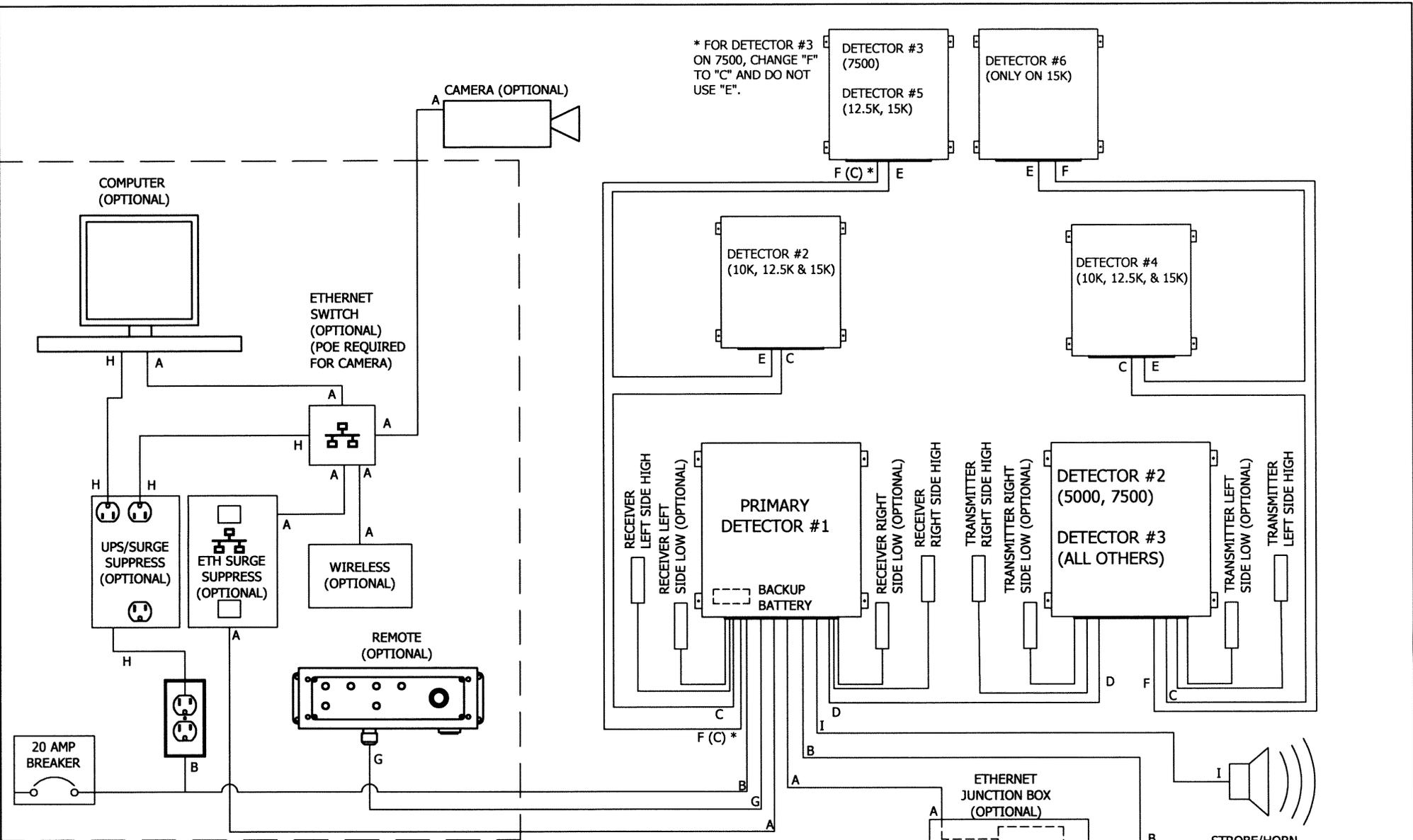
REV	DESCRIPTION	DATE	BY
4	ADDED 6" TO EXTENTION, ADDED CUTOUTS	7-29-13	RHS
5	ADDED HOLES ECF-5165	6-17-19	CMC
6	ECF2837 DET SPACING CHANGED TO 12'	11-17-20	ZJM



**MATERIAL:**  
 W12 X 16 STEEL I-BEAM  
 IMPERIAL  
 (12" X 4" X 16 LB/FT)  
 METRIC  
 (310mm x 100mm x 23.8 kg/m)



DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/17/2020			Jbw	12-17-20
<b>DWG NUM: 4511-928</b>				SCALE: --	
<b>TITLE M 4525-5000 STAND OVERHEAD</b>					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 928V	



COMPONENTS INSIDE DASHED LINES ARE INSIDE BUILDING

**CONDUIT AND WIRING LABELS**

- A = ETHERNET (CAT5E) CABLE 21-8318 (LUDLUM SUPPLIED) (3/4" CONDUIT)
- B = AC POWER, 3 CONDUCTORS OF #12 SOLID (3/4" CONDUIT)
- C = DETECTOR CABLE BELDEN 8774 21-9339-100 (LUDLUM SUPPLIED) (3/4" CONDUIT)
- D = DETECTOR CABLE BELDEN 8774 21-9339-100 (LUDLUM SUPPLIED) (1" CONDUIT)
- E = DETECTOR CABLE BELDEN 8761 22-9412 (LUDLUM SUPPLIED) (3/4" CONDUIT)
- F = DETECTOR CABLE BELDEN 8305 21-9186 (LUDLUM SUPPLIED) (3/4" CONDUIT)
- G = REMOTE CABLE BELDEN 9946 21-9178 (LUDLUM SUPPLIED) (1" CONDUIT)
- H = POWER CORD SUPPLIED WITH DEVICE
- I = 2 CONDUCTORS OF #14 OR LARGER FOR 12 VDC (3/4" CONDUIT)

APPLICABLE TO Model 4525-5000, 7500, 10000, 12500, AND 15000

PART NO: 4517-682

DWN DATE	CHECKED	APPROVED
JGW 8-2-23		Jow 8-2-23

TITLE: M 4525 GENIV DUAL CHANNEL BLOCK DIAGRAM

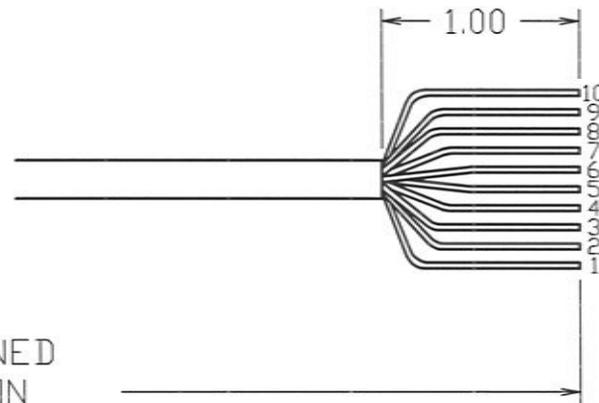
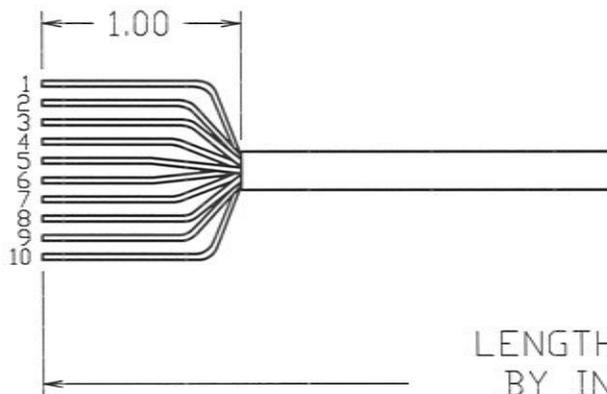
REV #	ALTERATIONS	DATE	BY	LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556	SERIES	SHEET
1	VALID	7-17-23	JGW		517	682

REV #	ALTERATIONS	DATE	BY
1	VALID	6-11-04	CMC
2	CHANGED LENGTH FROM 250ft TO 100ft	8-14-09	TMM

BOTH ENDS ARE IDENTICAL

CRIMP ON CONNECTOR  
 #13-8042, 10 PIN MTA 100 RED  
 DO NOT STRIP THIS END  
 BLACK IN PIN 1  
 GREEN IN PIN 2  
 WHITE IN PIN 3  
 PURPLE IN PIN 4  
 BROWN IN PIN 5  
 BLUE IN PIN 6  
 ORANGE IN PIN 7  
 YELLOW IN PIN 8  
 RED IN PIN 9  
 GRAY IN PIN 10

CRIMP ON CONNECTOR  
 #13-8042, 10 PIN MTA 100 RED  
 DO NOT STRIP THIS END  
 BLACK IN PIN 1  
 GREEN IN PIN 2  
 WHITE IN PIN 3  
 PURPLE IN PIN 4  
 BROWN IN PIN 5  
 BLUE IN PIN 6  
 ORANGE IN PIN 7  
 YELLOW IN PIN 8  
 RED IN PIN 9  
 GRAY IN PIN 10



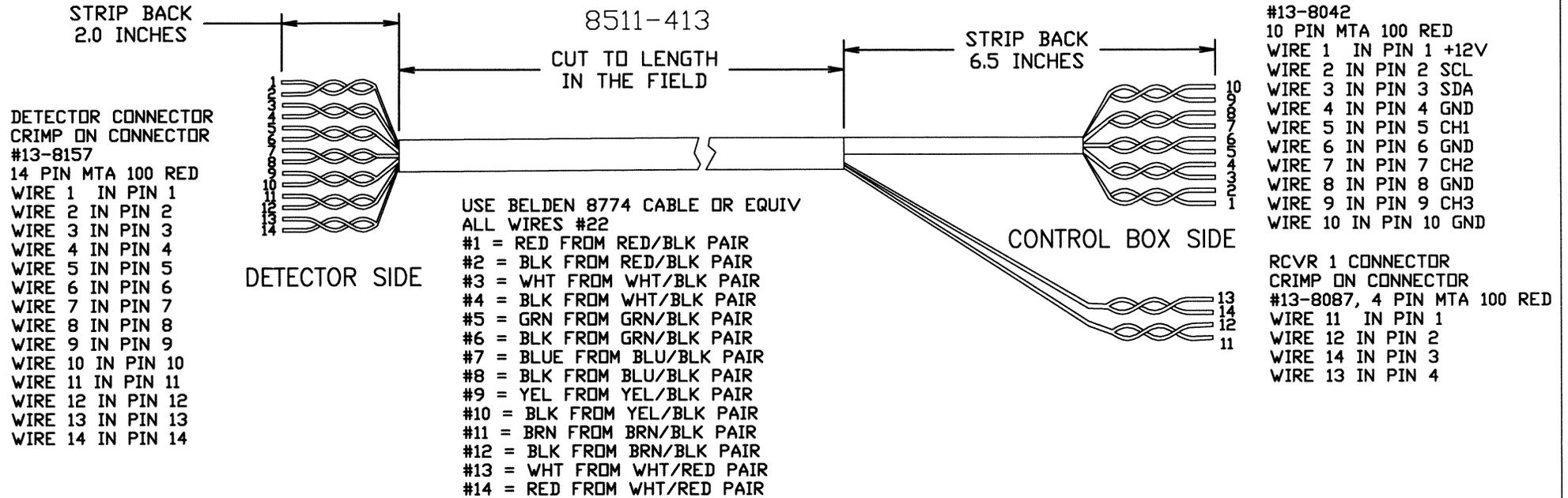
LENGTH DETERMINED  
 BY INSTALLATION  
 USE BELDEN 9946 CABLE

8511-140 IS 100 FT LONG

PART NO: 8511-140			
DWN	DATE	CHECKED	APPROVED
TMM	8/14/2009		<i>TMM 09-17-2009</i>
TITLE: M 4525 REMOTE CABLE			
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 140

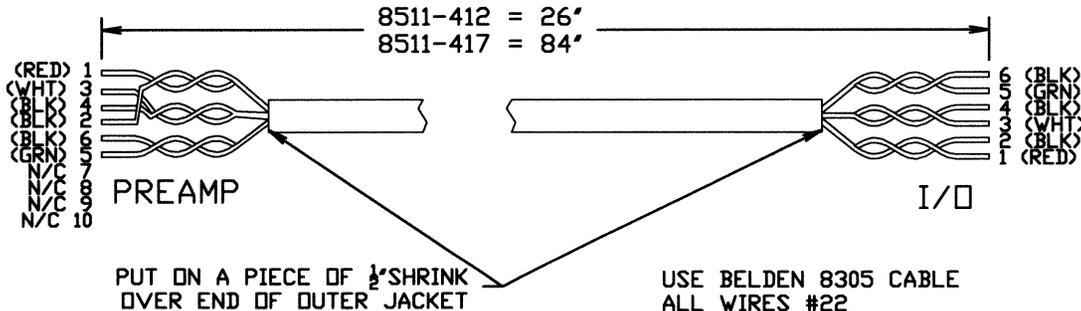
REV #	ALTERATIONS	DATE	BY
1	VALID	7-5-07	JGW
2	BRN/BLK PAIR WAS BRN/RED	10-22-07	JGW
3	4 PIN MTA WAS 2x 3 PIN	07-08-21	DLJ

CONTROL BOX TO PRIMARY  
DETECTOR CABLE  
8511-413



REV #	ALTERATIONS	DATE	BY
1	VALID	7-5-07	JGW
2	CONN AND LABELS WERE OPPOSITE	10-17-07	JGW
3	5&6 WERE OPPOSITE ON I/O END	11-15-07	JGW

CRIMP ON CONNECTOR  
#13-8042, 10 PIN MTA 100 RED  
PINS DOWN !  
DO NOT STRIP THIS END  
WIRE 1 IN PIN 1 +12V  
WIRE 3 IN PIN 2 SDA  
WIRE 4 IN PIN 3 GND  
WIRE 2 IN PIN 4 SCL  
WIRE 6 IN PIN 5 GND  
WIRE 5 IN PIN 6 CH  
NC IN P7 THRU P10  
LABEL THIS END 'PREAMP'

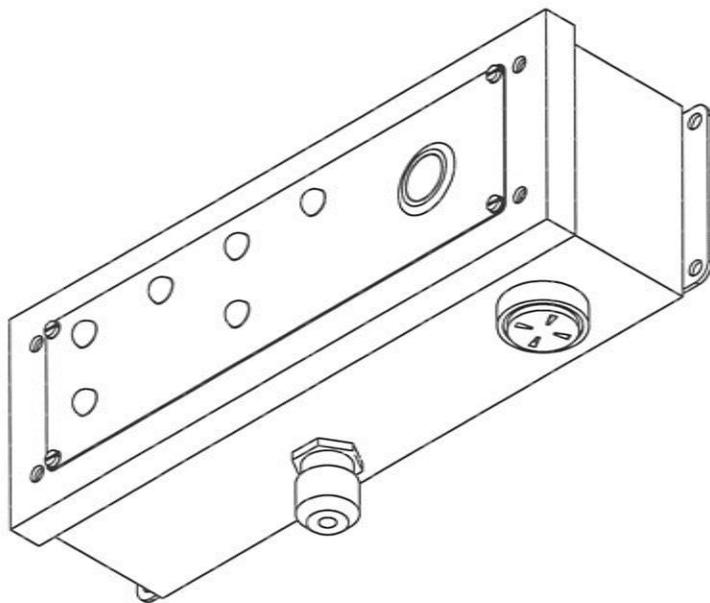
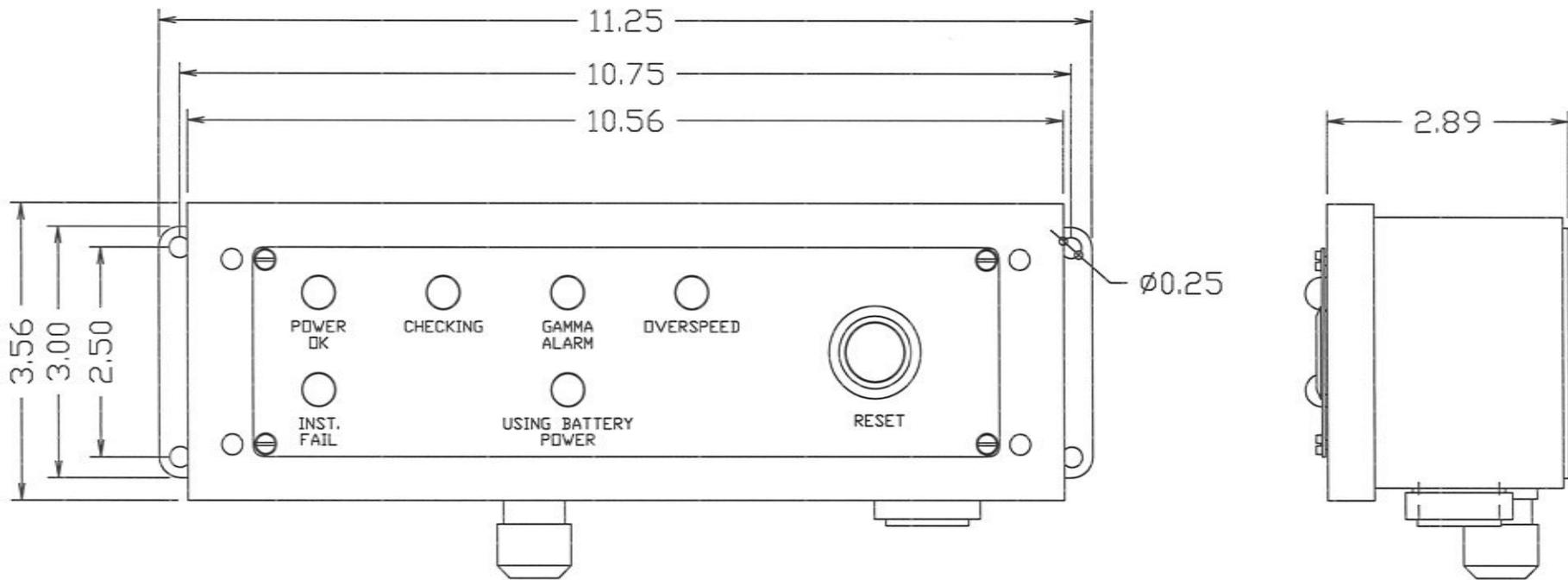


PRIMARY AND SECONDARY  
DETECTOR PREAMP CABLE  
8511-412 & 8511-417

NOTE: THIS WIRE UP CAN BE USED TO GO DIRECTLY FROM CONTROL  
BOX TO PREAMP AND BYPASS THE DETECTOR I/O BOARD

OWN DATE DLJ 07-08-21	CHK DATE	APP DATE JGW 7-8-21
DWG NUM: 8511-413		SCALE: FULL <input type="checkbox"/> OTHER <input type="checkbox"/>
TITLEM 4525 CONT-PRIM & PREAMP CBL		
LUDLUM MEASUREMENTS, INC. 301 DAK STREET SWEETWATER, TEXAS 75556		SHEET 511 413

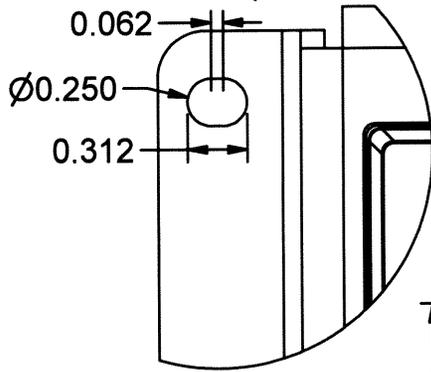
REV #	ALTERATIONS	DATE	BY
1	VALID	01-04-05	CLW



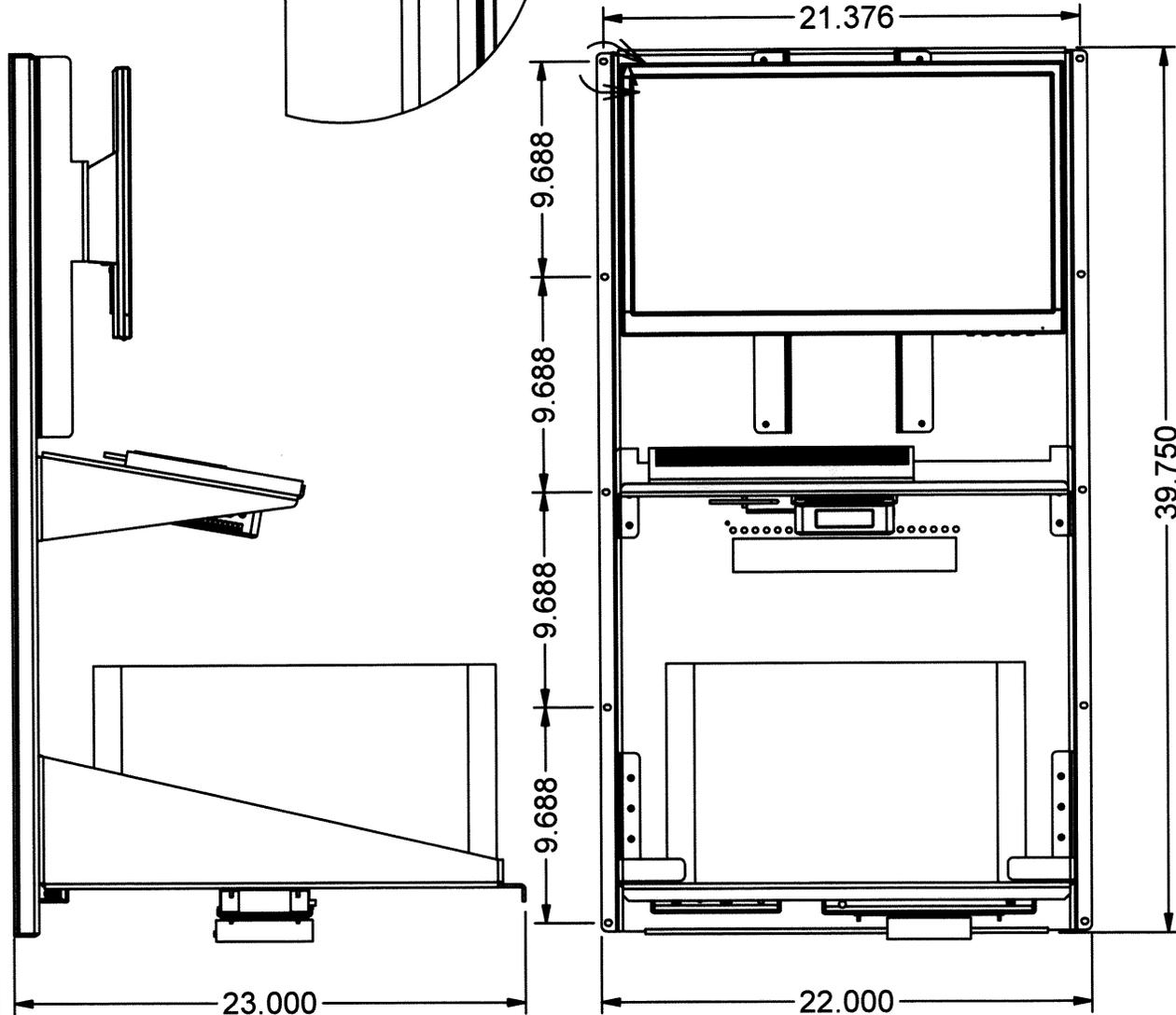
DWN	DATE	CHK	DATE	APP	DATE
CLW	01-04-05			CLW	1-4-05
DWG NUM: 4511-207			SCALE: FULL <input type="checkbox"/> OTHER <input type="checkbox"/>		
TITLE M 4525 REMOTE					
 LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			511	207A	

1/12

TYPICAL MOUNT  
SLOT (10 PLACES)

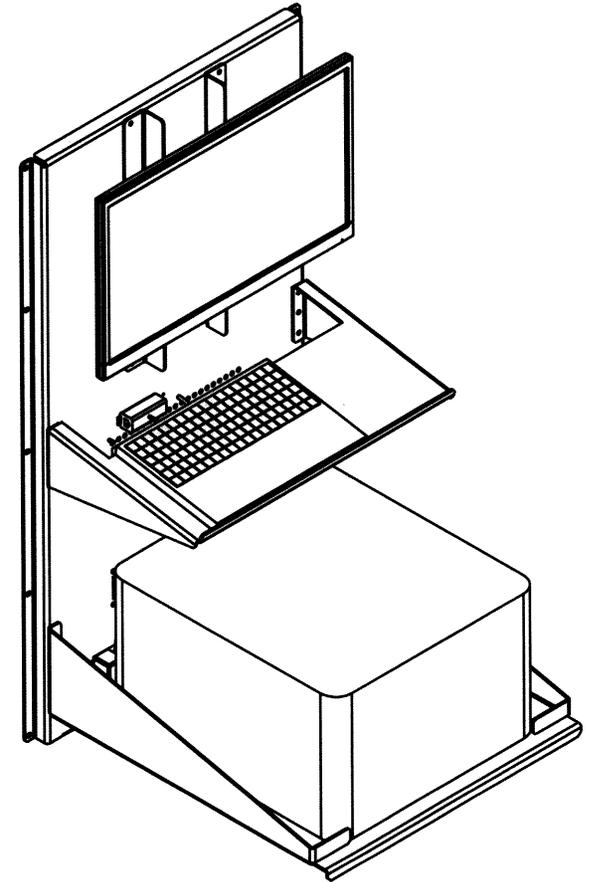


DETAIL A  
SCALE 1 : 1



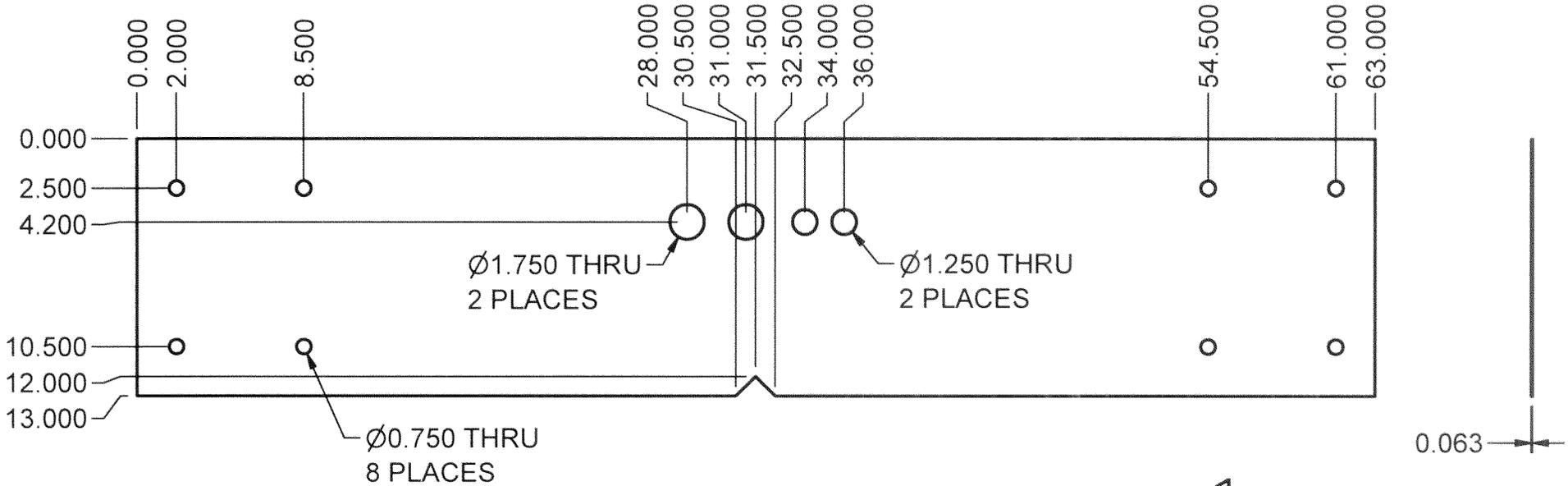
REVISION HISTORY

REV	DESCRIPTION	DATE	BY
7	ECF# 2700	10-25-19	CMC
8	PLANAR MONITOR EC2700	10-30-19	JGW
9	UPDATED COMPUTER PART NUMBER	11-5-19	CMC
10	ECF# 2700	6-29-21	CMC
11	EC# 5970	7-23-21	CMC



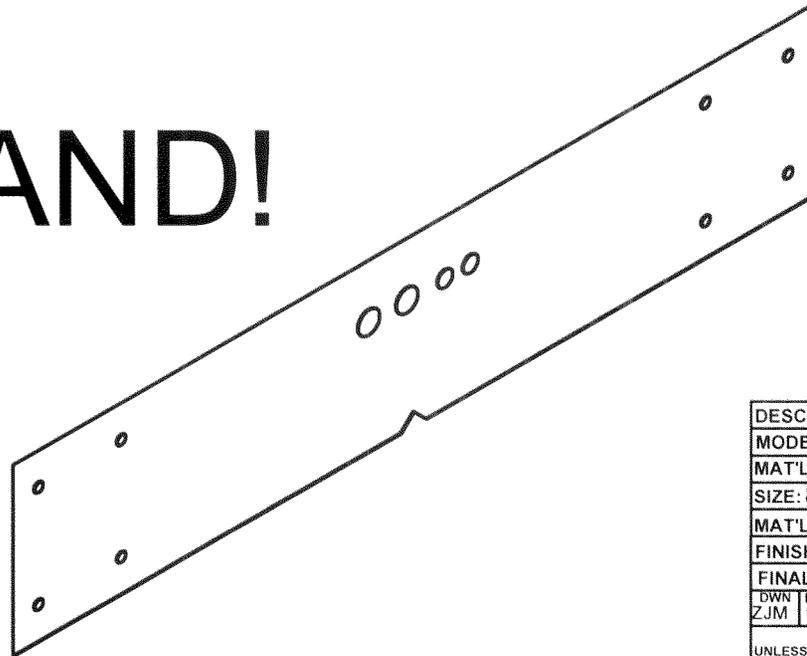
DWN	DATE	CHK	DATE	APP	DATE
CMC	7-23-21	JGW	7-23-21		
<b>DWG NUM:</b> 4396-850				<b>SCALE:</b> 1/8	
<b>TITLE</b> 4525 COMPUTER ASSEMBLY					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		<b>SERIES</b>	<b>SHEET</b>		
		396	850		

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	3-7-13	RHS
2	ECF 5688 CHANGED PN#	9-21-20	ZJM



**DO NOT SAND!**

NOTE:  
NOTCH IS FRONT  
OF STAND FACING  
TRAFFIC LANE



DESC: ANCHOR BOLT TEMPLATE			
MODEL NO.: 4525-5000		PART NO.: 7511-997-01	
MAT'L.: 16 GA HOT DIP GALV.			
SIZE: 819 SI.			
MAT'L. NO.: 37-9820			
FINISH: CLEAN, DON'T SAND			NO. REQ'D: 1
FINAL ASSY NO.:			
DWN	DATE	CHK	DATE
ZJM	9/21/2020		
APP	DATE	SILK SCREEN: N	
		9-21-20	
TOLERANCES UNLESS NOTED OTHERWISE			SCALE: 1/8
MILL, LATHE, SHEETMETAL = ± 0.005			ANGLES = ± 0.5°
BENDS ON SHEETMETAL PARTS = ± 0.010			
ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE			
LUDLUM MEASUREMENTS, INC 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 997

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	4/11/12	CMC
2	ADDED CONDUIT AND TEMPLATE	4/17/12	JGW
3	ADDED FROST LINE NOTE	3/31/21	ZJM

3/4"-10 (20mm) HEX NUT  
GRADE 5 OR BETTER

3/4" (20mm) FLAT WASHER  
F844 GENERAL USE OR BETTER

TYPICAL CONDUIT  
INSTALLATION

TEMPLATE MOUNTED ON ANCHOR  
BOLTS WHILE POURING CONCRETE

3/4"-10 (20mm) X 18" "L" FOUNDATION BOLT  
ASTM A36  
46 KSI TENSILE STRENGTH MINIMUM

4 in [10.2 cm]  
MINIMUM

GRADE LEVEL

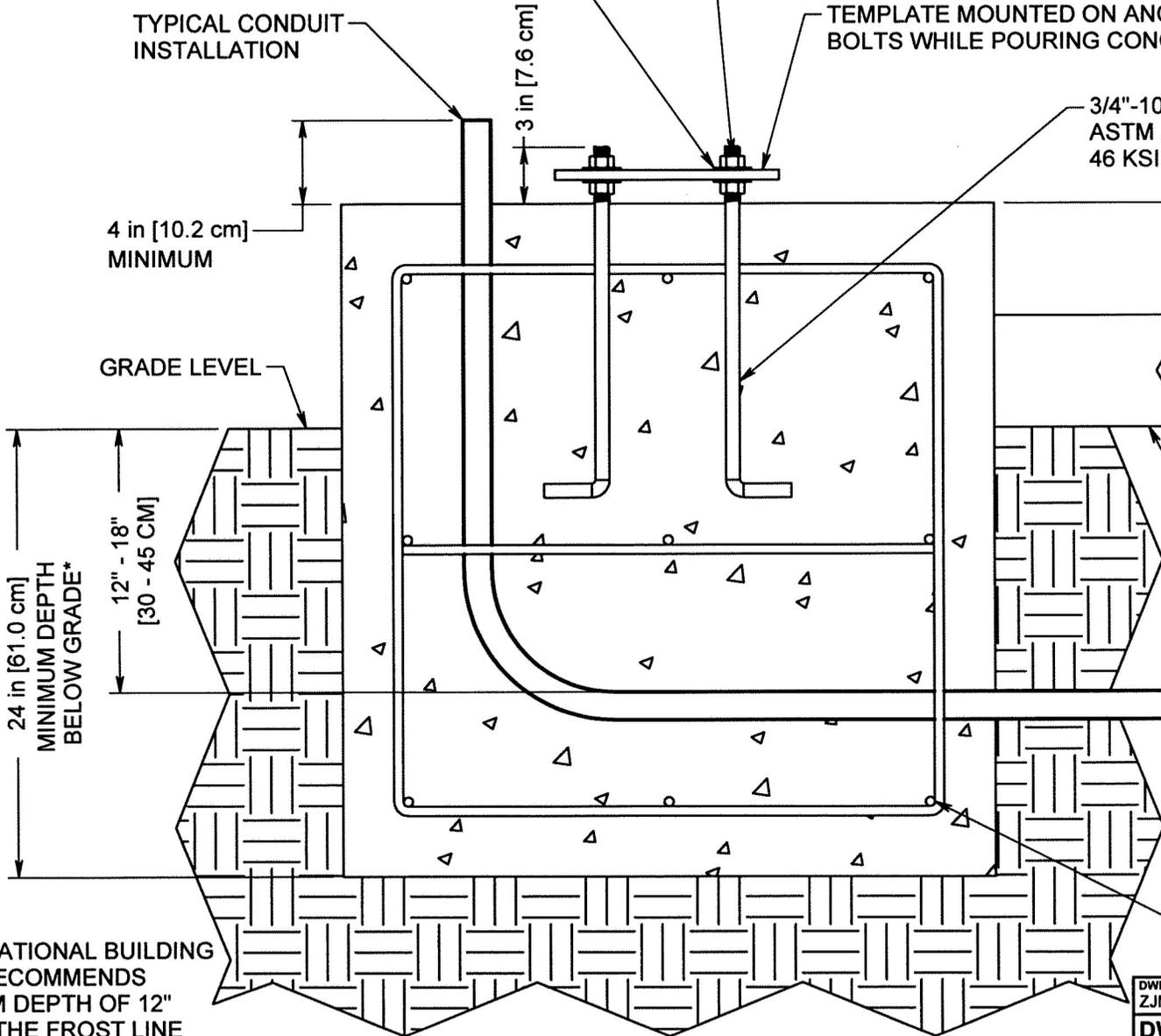
6 in [15.2 cm]

SCALE OR  
PAVEMENT

CONCRETE SHOULD BE  
3000 PSI OR BETTER.

CONCRETE REBAR RODS ON  
14" CENTERS OR AS  
DETERMINED BY LOCAL  
STANDARDS/CODES.

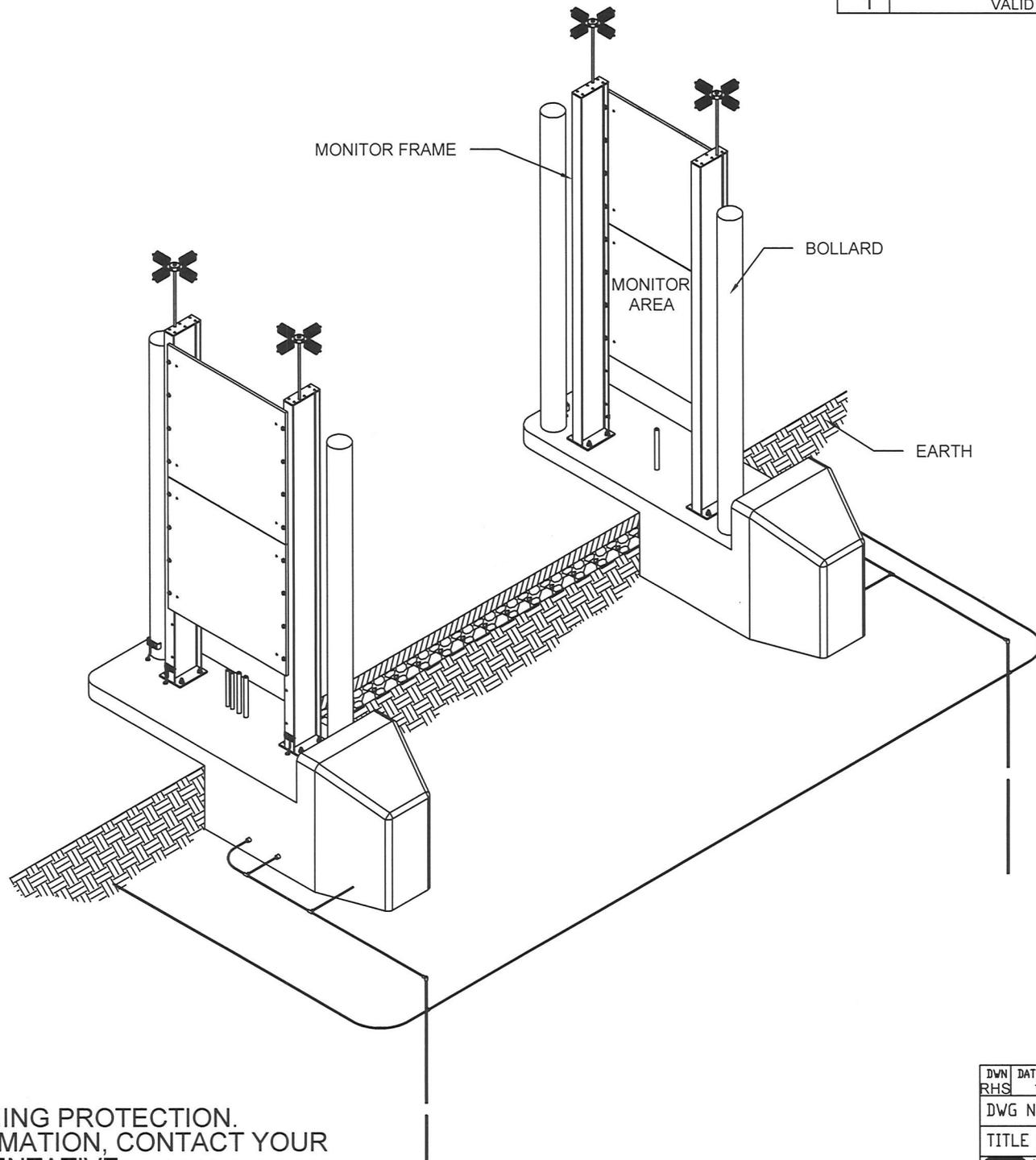
1/2" REBAR



\*INTERNATIONAL BUILDING  
CODE RECOMMENDS  
MINIMUM DEPTH OF 12"  
BELOW THE FROST LINE

DWN ZJM	DATE 3/31/2021	DESIGN AUTHORITY JGWITT	APP JGW	DATE 3-31-21
DWG NUM: 7511-836			SCALE: 1/9	
TITLE: M 4525 ANCHOR BOLT & CONCRETE				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 836

REV#	ALTERATIONS	DATE	BY
1	VALID	10-7-13	RHS



OPTIONAL LIGHTNING PROTECTION.  
FOR MORE INFORMATION, CONTACT YOUR  
LUDLUM REPRESENTATIVE.

DWN	DATE	CHK	DATE	APP	DATE
RHS	10-7-13			<i>[Signature]</i>	10-7-13
DWG NUM: 4511-1067			SCALE: <input checked="" type="checkbox"/> FULL <input type="checkbox"/> OTHER <input type="checkbox"/> NTS		
TITLE M 4525 GEN IV LIGHTNING PROTECTION					
 LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			511	1067	