

LUDLUM MODELS

4525-2400

4525-3500

4525-7000

4525-10500

4525-14000

4525-17500

4525-21000

RADIATION PORTAL MONITOR INSTALLATION MANUAL

September 2022

**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.

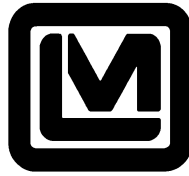
**LUDLUM MEASUREMENTS, INC.
ATTN: RADIATION SECURITY DIVISION
501 OAK STREET
SWEETWATER, TX 79556**

**800-622-0828 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
 (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 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)
<u>Comments:</u>	

Company: _____

Location: _____

Signature/Date: _____

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 Instruments*

Ludlum Model 4525 Site Photo Requirements

This list of Photos and the Check List must be submitted to 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
	3 different angles minimum —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) .
	1 each —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.
	2 each —Face of each detector, with doors closed, showing the placement of all infrared sensors.
	2 each —Face of each detector, with doors Opened, showing cables pulled through conduits and 24 inches (61cm) over pull.
	2 each —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.
	1 each —(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.
	2-4 each —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.
	1 each —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.
	1 each —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.
	Additional photos — 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.
<u>Comments:</u>	

Company: _____

Location: _____

Signature/Date: _____

Table of Contents

<i>Overview</i>	1
<i>Detector Stand Installation</i>	2
Shipping Crates	2-1
Stand Location – Buffer Zone	2-7
Stand Orientation	2-7
Typical Stand Setup	2-8
Setting Up The Stands	2-8
Anchor Bolts and Pattern	2-8
Conduit Requirements	2-14
Control Box	2-14
Cable Requirements	2-14
Control Box Wiring	2-15
Detector Wiring	2-16
Remote Display	2-17
Cat-5E LAN Cabling	2-17
Supervisor Computer	2-18
Miscellaneous Requirements	2-18
<i>Software and Network Installation</i>	3
Software Installation	3-1
Network Installation	3-2
Software License Agreement	3-9
<i>Drawings and Diagrams</i>	4

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. Some models are used in other applications as conveyor monitors or charge buckets. This manual is intended to assist you in the installation of the system.

Several different models and options are available. In general, the full model number tells the number of detectors – the Model 4525-7000 is a two-detector system, the Model 4525-10500 is a three-detector system, and the 4525-14000 system has four detectors. Each detector contains approximately 57,355 cm³ (3500 cubic inches) of plastic scintillator. There are also other systems available, like the Model 4525-2400, which has four 9832 cm³ (600 in³) detectors.

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.

Take a moment to review the block diagrams that are located at the back of this manual (Drawings 511 x 420 and 511 x 420A). Compare those drawings with the system that you have purchased or are about to purchase. The block diagram may

help you to understand the available options. You can also use the block diagram to locate where at your location the different components will be situated.

Section**2****Detector Stand Installation**

This procedure is intended to outline the stand installation of the Ludlum Model 4525-2400, 4525-7000, Model 4525-10500, and Model 4525-14000 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 4525-2400 WITHOUT STANDS

The system is shipped I one crate, containing:

- Four white PVC pipe detectors (Model 44-128-9), 152 x 12.7 x 5 cm (60 x 5 x 2 in.) each
- Two junction boxes
- 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 white control box enclosure
- If a computer is purchased with the system, it will be inside the crate.
- Eight infrared components with conduit
- Any other optional items will be packed in the crate with the detectors.
- The total shipping weight of the crate is approximately 408 kg (900 lb).

CRATE CONTENTS OF THE MODEL 4525-7000 WITHOUT STANDS

The system is shipped in one crate, containing:

- Two large (approximately 2.1 x 2.1 x 0.25 m {7ft x 2 ft x 10 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 white control box enclosure
- If a computer is purchased with the system, it will be inside the crate.
- Eight infrared components with conduit
- Any other optional items will be packed in the crate with the detectors.
- The total shipping weight of the crate is approximately 680 kg (1500 lb).

CRATE CONTENTS OF THE MODEL 4525-10500 WITHOUT STANDS

The system is shipped in two crates.

The first crate contains: Detector 1 and Detector 2.

The second crate contains: 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 white control box enclosure
- If a computer is purchased with the system, it will be inside the crate.
- Eight infrared components with conduit
- Any other optional items will be packed in the crate with the detectors.
- One crate is approximately 635 kg (1400 lb), and the other is approximately 454 kg (1000 lb).

CRATE CONTENTS OF THE MODEL 4525-14000 WITHOUT STANDS

The system is shipped in two crates, containing:

- Four large white detector boxes labeled Detector 1, 2, 3, and 4
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One 76.2m (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)
- One white control box enclosure
- If a computer is purchased with the system, it will be shipped inside the crate that contains Detector 1.
- Any other optional items will be packed in the crate with the detectors.
- The total shipping weight of each crate is approximately 680 kg (1500 lb).

PALLET CONTENTS OF THE MODEL 4525-2400 WITH STANDS

Each pallet contains ...

- 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)
- Eight infrared components with conduit
- If a computer is purchased with the system, the computer and white control box enclosure will be shipped in smaller crates strapped to the pallet.
- The total shipping weight of the two pallets is approximately 744 kg (1640 lb) (includes stand).

PALLET CONTENTS OF THE MODEL 4525-7000 WITH STANDS

Each pallet contains a large yellow detector stand with a large white detector box mounted inside the stand. Pallet 1 holds detector 1. The following items are strapped onto the pallet with Stand # 1.

- 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)
- Eight infrared components with conduit
- If a computer is purchased with the system, the computer and white control box enclosure will be shipped in smaller crates strapped to the pallet.
- The total shipping weight of the two pallets is approximately 1905 kg (4200 lb) (includes stand).

PALLET CONTENTS OF THE MODEL 4525-10500 WITH STANDS

The system comes in three pallets. The two smaller pallets contain a large yellow detector stand with a large white detector box mounted inside the stand. The large pallet contains a large yellow detector stand and white detector box attached to the overhead mounting frame. Also strapped to the large pallet are the mounting legs to suspend the overhead frame over the scale or lane. Pallet 1 holds Detector 1, Pallet 2 holds Detector 2 and the overhead holds Detector 3. The following items are strapped onto the pallet with Stand # 1:

- One hardware mounting kit containing the following:
 - Qty 32 $\frac{3}{4}$ in. x 3-inch long hex bolts
 - Qty 32 $\frac{3}{4}$ in. hex nuts
 - Qty 32 $\frac{3}{4}$ in. lock washers
 - Qty 32 $\frac{3}{4}$ in. flat washers
- 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)
- Eight infrared components with conduit
- If a computer is purchased with the system, it will be shipped in with the pallet.
- One white control box enclosure
- Any other optional items will be strapped on the pallet
- The total shipping weight of the three pallets is approximately 3719 kg (8200 lb) (includes stand).

**PALLET CONTENTS OF THE MODEL 4525-14000 WITH STANDS
(INCLUDING 1 CRATE)**

The system comes in three pallets. Each pallet contains one large, yellow detector stand with two large, white detector boxes mounted inside the stand. Pallet 3 contains the four each I-beam legs for mounting the stands. The crate contains:

- One hardware mounting kit containing the following:
 - Qty 16 $\frac{3}{4}$ x 3 in. long hex bolts
 - Qty 16 $\frac{3}{4}$ in. hex nuts
 - Qty 16 $\frac{3}{4}$ in. lock washers
 - Qty 16 $\frac{3}{4}$ in. flat washers
- One 30.5 m (100 ft) roll of cable for the remote (Belden 9946 or equivalent)
- One 76.2 m (250 ft) roll of CAT-5E cable for Ethernet connection (Belden 1501A or equivalent)
- One 30.5 m (100 ft) roll of cable for the detectors (Belden 8774 or equivalent)
- One white control box enclosure
- Eight infrared components with conduit
- If a computer is purchased with the system, it will be shipped in the crate.
- Any other optional items will be strapped to the crate.
- The shipping weight of pallets 1 and 2 is approximately 1814 kg (4000 lb) each (includes stands).
- Weight of the third pallet is approximately 249 kg (550 lb) Weight of the crate is approximately 318 kg (700 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 Model 4525-10500 and Model 4525-14000, remove the I-beam legs and keep them accessible for preassembly.

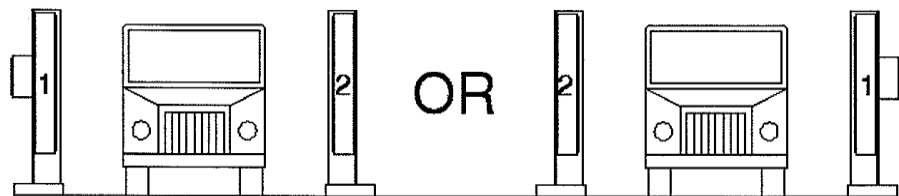
Stand Location – Buffer Zone

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 384 x 1054 in the back of this manual. 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.

Stand Orientation

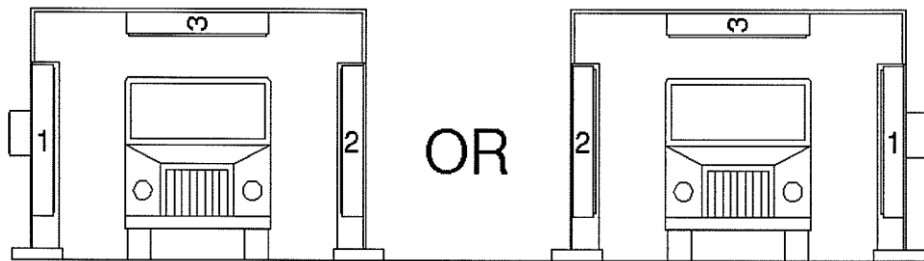
Detector 1 has the control box mounted to its stand. Detector 1 should go on the side with the four conduits coming out of the pad. See figure below for layout.

MODELS 4525-2400 AND 4525-7000

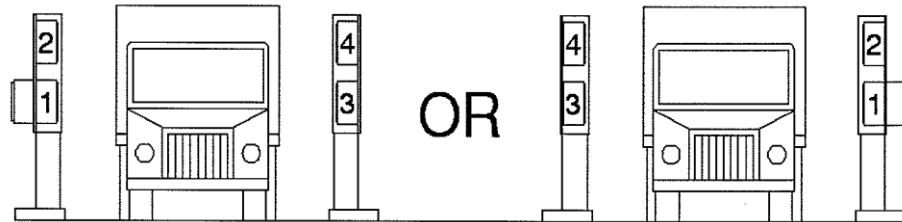


DETECTORS ARE LABELLED WITH NUMBERS

MODEL 4525-10500



DETECTORS ARE LABELLED WITH NUMBERS

MODEL 4525-14000

DETECTORS ARE LABELLED WITH NUMBERS

Typical Stand Setup

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

Model 4525-2400: Drawings 511 x 718 through 511 x 718E

Model 4525-7000: Drawings 511 x 375 through 511 x 375D

Model 4525-10500: Drawings 511 x 439 through 511 x 439D

Model 4525-14000: Drawings 511 x 376A through 511 x 376E

Model 4525-17500: Drawings 511 x 294 through 511 x 294D

Model 4525-21000: Drawings 511 x 311 through 511 x 311E

Setting up the Stands

ANCHOR BOLTS AND PATTERN

For anchor bolt specifications, see Drawing 511 x 836, which is the second to last drawing in Section 4 Drawings & Diagrams at the end of this manual. 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 drawings (The anchor bolt drawings listed below are listed in an index at the beginning of Section 4. An anchor bolt template is listed at the end of almost every system.):

Models 4525-2400 and 4525-7000 = Drawing 511 x 461

Model 4525-10500 = Drawing 511 x 449

Model 4525-14000 = Drawing 384 x 882

Model 4525-17500 = Drawing 384 x 1100

The anchor bolts should protrude from the concrete from 10 to 12.7 cm (4 to 5 in.).

Note:

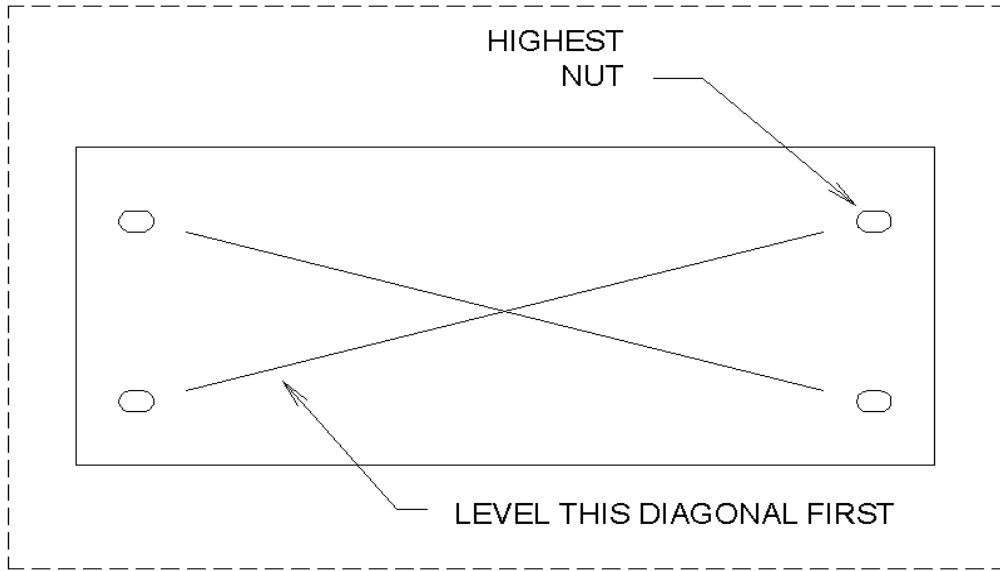
LMI recommends the use of a template to be sure the anchor bolt holes are placed in the correct locations. These can be supplied by LMI. The part numbers are:
Models 4525-2400 and 4525-7000 template part number 7511-461 (2 each needed)
Model 4525-10500 template part number 7511-449 (2 each needed)
Model 4525-14000 template part number 7384-882 (2 each needed)
Model 4525-17500 template part # 7384-1100 (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.

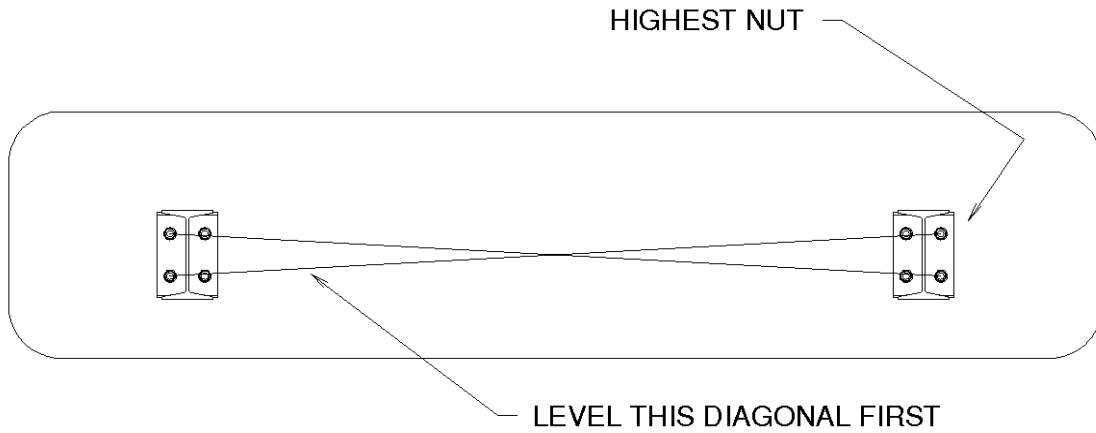
LEVELING

- 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.

Models 4525-2400, 4525-7000, and 4525-10500 Individual Stand Leveling



Model 4525-14000 Individual Stand Leveling



LIFTING**Models 4525-2400 and 4525-7000**

- 1) All stands should be equipped with removable lifting lugs attached to the top of the stands. Use a lifting harness rated for at least 1361 kg (3000 lb).
- 2) During lifting, the unit will lean towards the back. This will allow you to engage two bolts first, and then the rest will align as the stand is lowered (provided care was used in placing the bolts).
- 3) Before removing the lift harness (and lifting lugs) the four stand-mounting nuts will need to be in place.

Model 4525-10500

- 1) Remove the lifting lugs from the individual big yellow boxes and install them into the top of the overhead stand legs. The top is the end with the gusset beams. Use a lifting harness rated for at least 1361 kg (3000 lb).
- 2) Raise the legs and set them into place on the anchor bolts in the concrete pad. Secure them into place. Remove lifting lugs. **To lift the overhead frame, use TWO lifting harnesses, each rated for at least 1361 kg (3000 lb).** Wrap one harness around the beams and against the end of the yellow box. Wrap the other the same way on the other end of the yellow box. Hook into both straps to lift. Set the overhead into position, attach all screws, and securely tighten.
- 3) Replace the lifting lugs into the lower-stand, yellow boxes. Tighten securely.
- 4) During lifting of the lower stands, the stands will lean towards the back. This will allow you to engage two bolts first, and then the rest will align as the stand is lowered (provided care was used in placing the bolts).
- 5) Before removing the lift harness (and lifting lugs) the four stand mounting nuts will need to be in place.

Model 4525-14000

- 1) Be sure that the I-beam legs are attached before lifting.
- 2) All stands should be equipped with removable lifting lugs attached to the top of the stands. Use a lifting harness rated for at least 2268 kg (5000 lb). Be sure to attach harness(es) to all four lifting lugs. Two lugs are not strong enough to support the weight of the stand.
- 3) Before removing the lift harness (and lifting lugs), the stand mounting nuts will need to be in place.

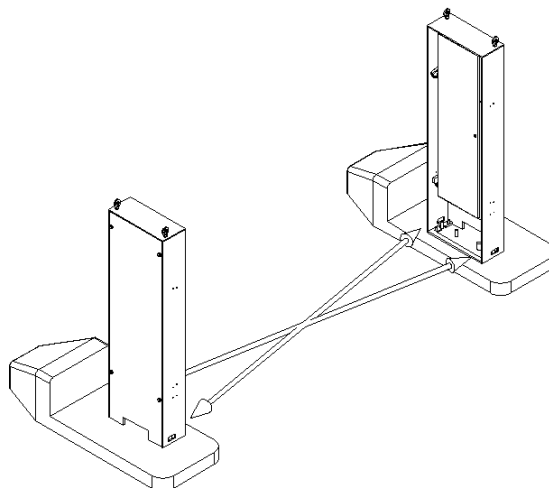
TORQUE SPECS FOR 3/4-INCH BOLTS/NUTS (NOT SUPPLIED)

- 1) Grade 2 = 155 ft-lbs
- 2) Grade 3 (or 100,000 PSI Stainless Steel) = 234 ft-lbs.
- 3) Grade 5 = 257 ft-lbs
- 4) Grade 8 = 380 ft-lbs.

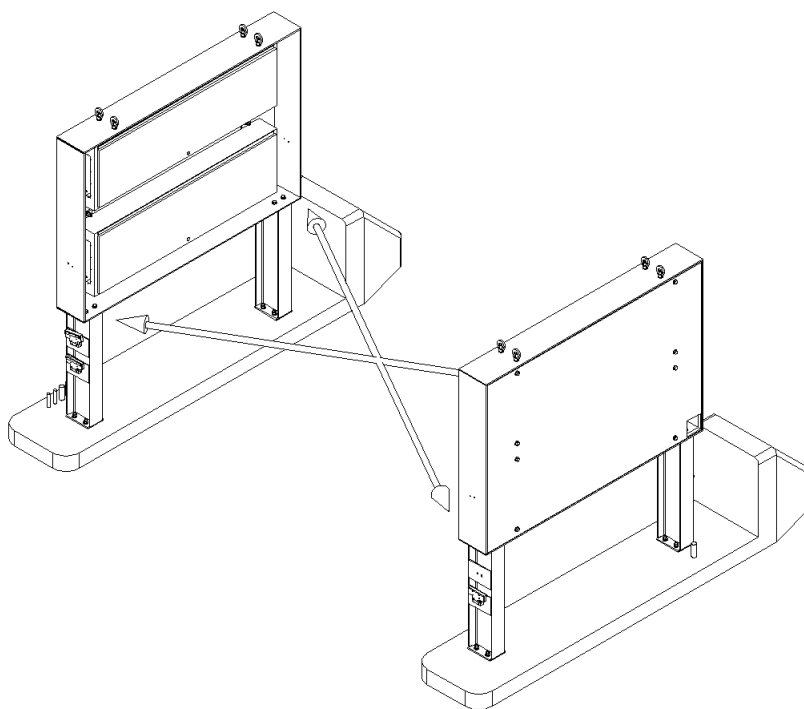
SQUARING

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 on the following page).

MODELS 4525-2400, 4525-7000, AND 4525-10500 DIAGONAL SQUARING



MODEL 4525-14000 DIAGONAL SQUARING



Conduit Requirements

The bottom of each detector is pre-drilled for conduit connections. Refer to Drawing 511 × 718C for Model 4525-2400 and 4525-7000, Drawing 511 x 439C for Model 4525-10500, Drawing 511 × 376C for Model 4525-14000, Drawing 511 x 294C for Model 4525-17500, and 511 x 311C for Model 4525-21000 for conduit sizes and locations in the concrete pad.

Note:

All additional conduit, from out of the concrete up to the enclosures need to be WATERTIGHT METALLIC.

Control Box

The control box, a white electronics enclosure, is typically mounted on the back of the stand containing Detector 1. Four each $\frac{3}{8}$ -inch stainless steel bolts with a length of 1.9 cm (0.75 in.) should be used to mount the control box as shown in the installation drawings.

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 # 14-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.

Control Box Wiring

Control Box to Primary Detector Cable

DETECTOR SIDE

14 Pin MTA

14 Red from White Red
 13 White from White Red
 12 Black from Brown Black
 11 Brown from Brown Black
 10 Black from Yellow Black
 9 Yellow from Yellow Black
 8 Black from Blue Black
 7 Blue from Blue Black
 6 Black from Green Black
 5 Green from Green Black
 4 Black from White Black
 3 White from White Black
 2 Black from Red Black
 1 Red from Red Black

CONTROL BOX SIDE

10 Pin MTA

10 Black from Yellow Black
 9 Yellow from Yellow Black
 8 Black from Blue Black
 7 Blue from Blue Black
 6 Black from Green Black
 5 Green from Green Black
 4 Black from White Black
 3 White from White Black
 2 Black from Red Black
 1 Red from Red Black

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

Infrared Sensor Connections

TO SENSOR 1

3 Pin MTA3

3 N/C
 2 Black from Brown Black
 1 Brown from Brown Black

TO SENSOR 2

Pin MTA

3 White from White Red
 2 Red from White Red
 1 N/C

Detector Wiring

Primary and Secondary Preamp Cable

TO PREAMP

10 Pin MTA

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

TO I/O BOARD

6 Pin MTA

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.

IR Sensor Wiring

PRIMARY DETECTOR #1

Receiver Left Side "B"	Wire Color	MTA#	Cut Black Wire	Label
	Blue/Grey	#3		LSL, LSH
	White	#2		
	Brown	#1		
Receiver Right Side "A"	Blue	#3	Cut Black Wire	RSL, RSH
	White	#2		
	Brown/Grey	#1		

PRIMARY DETECTOR #2

Transmitter Left Side "A"	Blue	#3	Cut Black Wire	LSH, LSL
	Blank	#2	Cut White Wire	
	Brown/Grey	#1		
Transmitter Right Side "B"	Blue/Grey	#3	Cut Black Wire	RSH, RSL
	Blank	#2	Cut White Wire	
	Brown	#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 control box 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 control box electronics 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

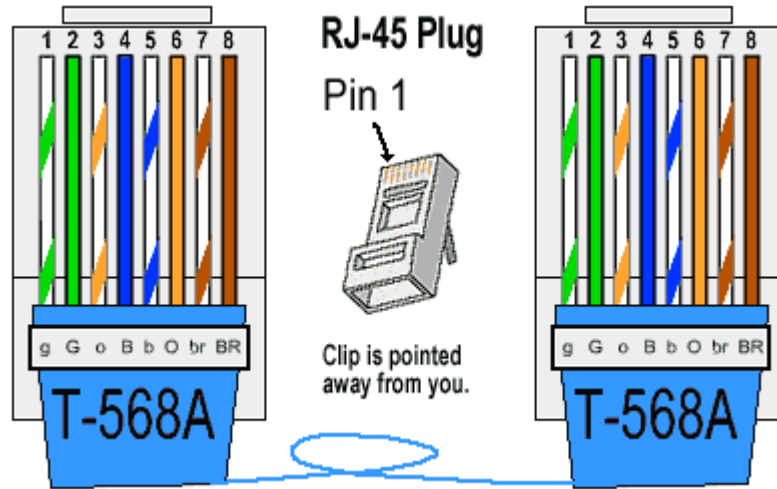
T568A and T568B are the two color codes used in wiring RJ45 eight-position modular plugs. The American National Standard Institute/Telephone Industry Association/Electronics Industry Association (ANSI/TIA/EIA) wiring standards allow both of these color codes. The only difference is that the orange and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

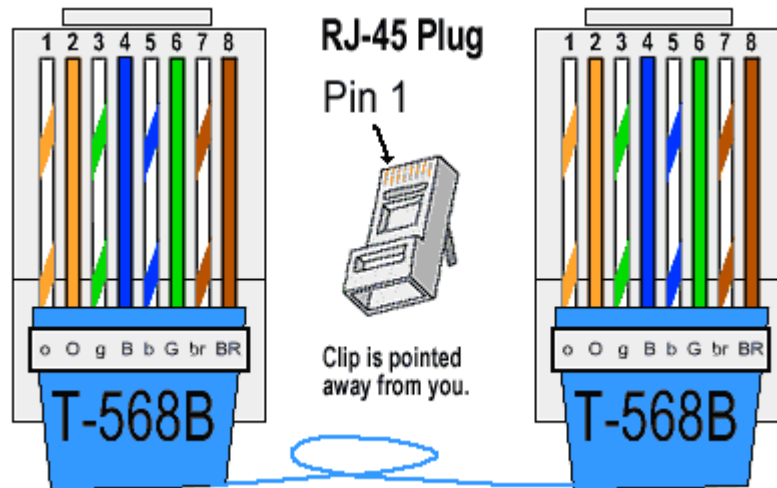
U.S. Government regulations require the use of the preferred T568A standard for wiring done under federal contracts.

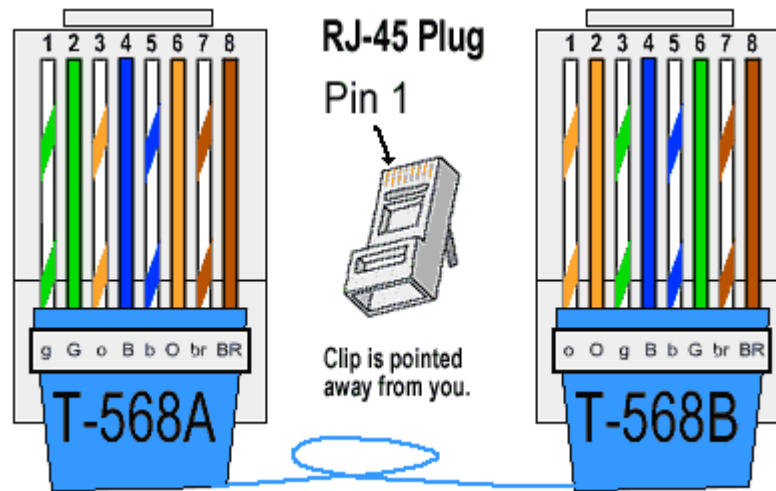
T-568A STRAIGHT-THROUGH ETHERNET CABLE



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.

**LUDLUM MEASUREMENTS, INC.**

501 OAK ST., P.O. BOX 810

SWEETWATER, TX 79556

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

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Rev. (number) 1.0**Written by (or Revised by):****Date:** 20 Jan 06**Approved by:****Date:** 20 JAN 06

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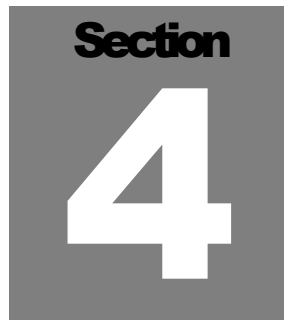
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A graphic consisting of a dark gray square. At the top, the word "Section" is written in a bold, black, sans-serif font. Below it, a large, white, bold number "4" is centered within the square.

Drawings & Diagrams

**Applicable to
4525-2400, 4525-
7000, 4525-10500,
4525-14000, AND
4525-17500
systems**

Model 4525 -7000, 14000 BLOCK OPTIONS, Drawing 511 X 420
Model 4525 -7000, 14000 BLOCK- NO OPTIONS, Drawing 511 X 420A
Model 4525-7000, 14000 220V BLOCK OPTIONS, Drawing 511 x 861
Model 4525 REMOTE CABLE, Drawing 511 X 140
Model 4525 CONT-PRIM & PREAMP CBL, Drawing 511 X 413
Model 4525 REMOTE/AUDIO BOX, Drawing 511 X 207A
Model 4525 COMPUTER, Drawing 396 X 850
Model 4525 BUFFER ZONE, Drawing 384 X 1054

**Model 4525-2400
system**

Model 4525-2400 TYPICAL ISNTALLATION, Drawing 511 x 718
Model 4525-2400 DETECTOR ELEVATION, Drawing 511 x 718A
Model 4525-2400 AERIAL VIEW, Drawing 511 x 718B
Model 4525-2400 PLAIN VIEW, Drawing 511 X 718C
Model 4525-2400 STEEL CONSTRUCTION, Drawing 511 x 718D
Model 4525-2400 SENSITIVE AREA, Drawing 511 x 718E
Model 4525-2400 ANCHOR BOLT TEMPLATE, Drawing 511 × 461
(same drawing for the 4525-7000)

**Model 4525-7000
system**

Model 4525-7000 TYPICAL INSTALLATION, Drawing 511 × 375
Model 4525-7000 DETECTOR ELEV, Drawing 511 X 375A
Model 4525-7000 AERIAL VIEW, Drawing 511 × 375B
Model 4525-7000 STEEL CONSTRUCTION, Drawing 511 × 375C
Model 4525-7000 STEEL SENSITIVE AREA, Drawing 511 × 375D
Model 4525-7000 ANCHOR BOLT TEMPLATE, Drawing 511 × 461

**Model 4525-10500
system**

Model 4525-10500 TYPICAL INSTALLATION, Drawing 511 × 439
Model 4525-10500 DETECTOR ELEV, Drawing 511 X 439A
Model 4525-10500 AERIAL VIEW, Drawing 511 × 439B
Model 4525-10500 PLAIN VUEW, Drawing 511 × 439C
Model 4525-10500 SENSITIVE AREA, Drawing 511 × 439D
Model 4525-10500 ANCHOR BOLT TEMPLATE, Drawing 511 × 449

**Model 4525--14000
system**

Model 4525-14000 TYPICAL INSTALLATION, Drawing 511 × 376
Model 4525-14000 DETECTOR ELEVATION, Drawing 511 × 376A
Model 4525-14000 AERIAL VIEW, Drawing 511 X 376B
Model 4525-14000 PLAIN VIEW, Drawing 511 × 376C
Model 4525-14000 STEEL CONSTRUCTION, Drawing 511 × 376D
Model 4525-14000 SENSITIVE AREA, Drawing 511 x 376E
Model 4525-14000 VERTICAL INSTALLATION WITH BRACE 14 FT,
Drawing 517 x 598, 517 x 598A, and 517 x 598B
Model 4525-14000 RAIN SHIELD, Drawing 384 x 849D
Model 4525-14000 ANCHOR BOLT TEMPLATE, Drawing 384 × 882

**Model 4525--17500
system**

Model 4525-17500 TYPICAL INSTALLATION, Drawing 511 x 294
Model 4525-17500 DETECTOR ELEVATION, Drawing 511 x 294A
Model 4525-17500 AERIAL VIEW, Drawing 511 x 294B
Model 4525-17500 PLAIN VIEW, Drawing 511 x 294C
Model 4525-17500 SENSITIVE AREA, Drawing 611 x 294D
Model 4525-17500 ANCHOR BOLT TEMPLATE, Drawing 384 X 1100

**Model 4525--21000
system**

Model 4525-21000 TYPICAL INSTALLATION, Drawing 511 x 311
Model 4525-21000 DETECTOR ELEVATION, Drawing 511 x 311A
Model 4525-21000 AERIAL VIEW, Drawing 511 x 311B
Model 4525-21000 PLAIN VIEW, Drawing 511 x 311C
Model 4525-21000 SENSITIVE AREA, Drawing 511 x 311D
Model 4525-21000 CONCRETE LAYOUT, Drawing 511 x 311E.

**Example of
Conveyor System**

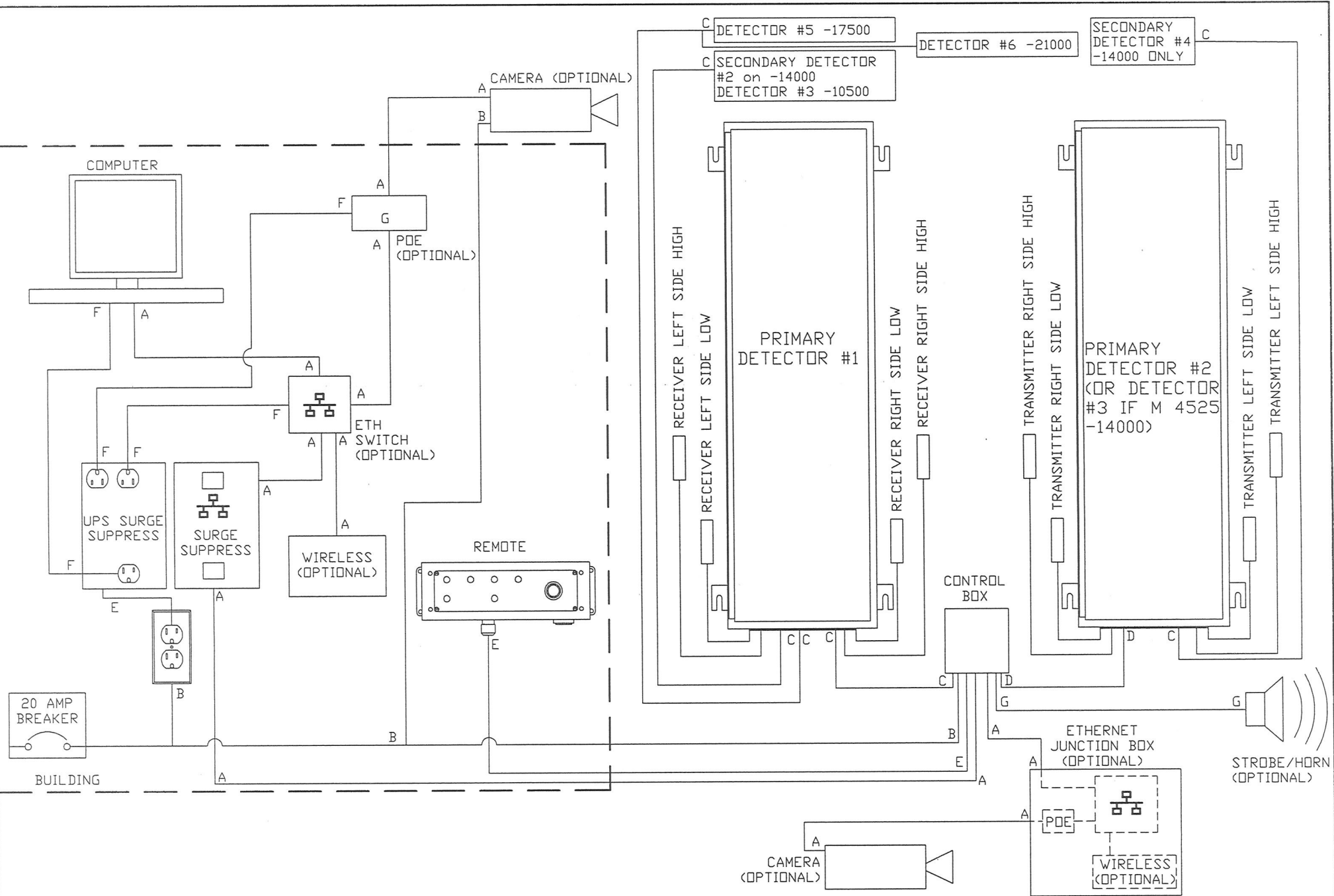
Model 4525-3500 CONVEYOR INSTALLATION, Drawing 396 x 957

**Example of Charge
Bucket System**

Model 4525-7000 CHARGE BUCKET ELEVATION, Drawing 517 x 270A

**Extras for 4525
Series**

Model 4525 ANCHOR BOLT & CONCRETE 511 × 836
Model 4525 DUAL TRAFFIC LIGHT WIRING DIAGRAM, Drawing 558 x 211



- A = ETHERNET (CAT5E) CABLE (LUDLUM SUPPLIED) (3/4" CONDUIT)
- B = 3 CONDUCTORS OF #12 SOLID (3/4" CONDUIT)
- C = DETECTOR CABLE BELDEN 9768 (LUDLUM SUPPLIED) (3/4" CONDUIT)
- D = DETECTOR CABLE BELDEN 9768 (LUDLUM SUPPLIED) (1" CONDUIT)
- E = REMOTE CABLE BELDEN 9946 (LUDLUM SUPPLIED) (1" CONDUIT)
- F = POWER CORD SUPPLIED WITH DEVICE
- G = 2 CONDUCTORS OF #14 OR LARGER FOR 12 VDC (3/4" CONDUIT)

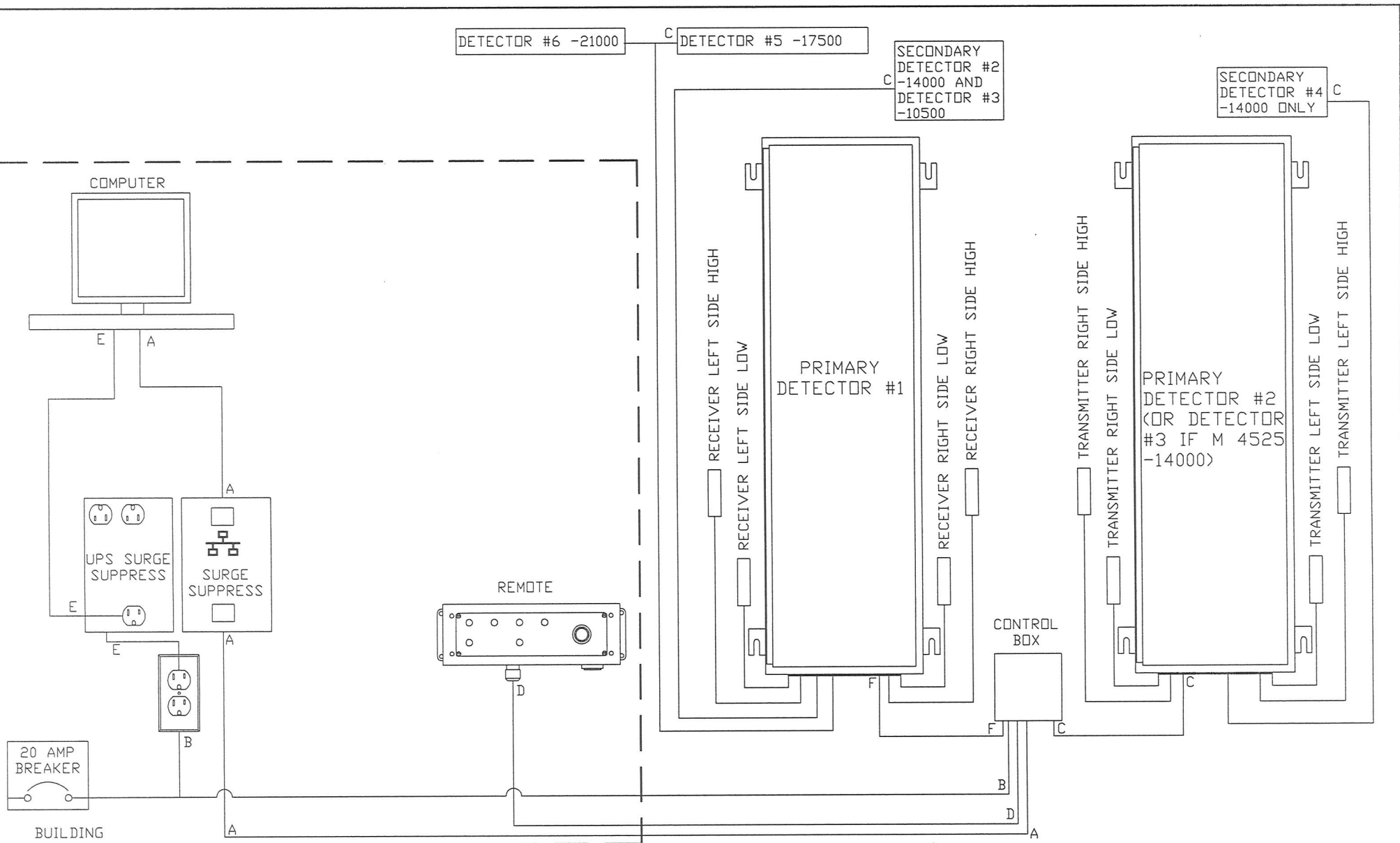
REV #	ALTERATIONS	DATE	BY
2	CHANGED CONDUIT SIZES	9-17-07	JGW
3	CHANGED CONDUIT SIZES ECF2243	10-25-07	RHS
4	ADDED INFO ECF# 2264	12-26-07	RHS
5	ADDED INFO FOR 17500	8-12-14	JGW
6	ADDED INFO FOR 21000	3/5/15	WJM

PART NO: 4511-420

DWN DATE WJM 3/5/15	CHECKED	APPROVED JGW 3-5-15
------------------------	---------	------------------------

TITLE: M 4525 SERIES BLOCK-OPTIONS

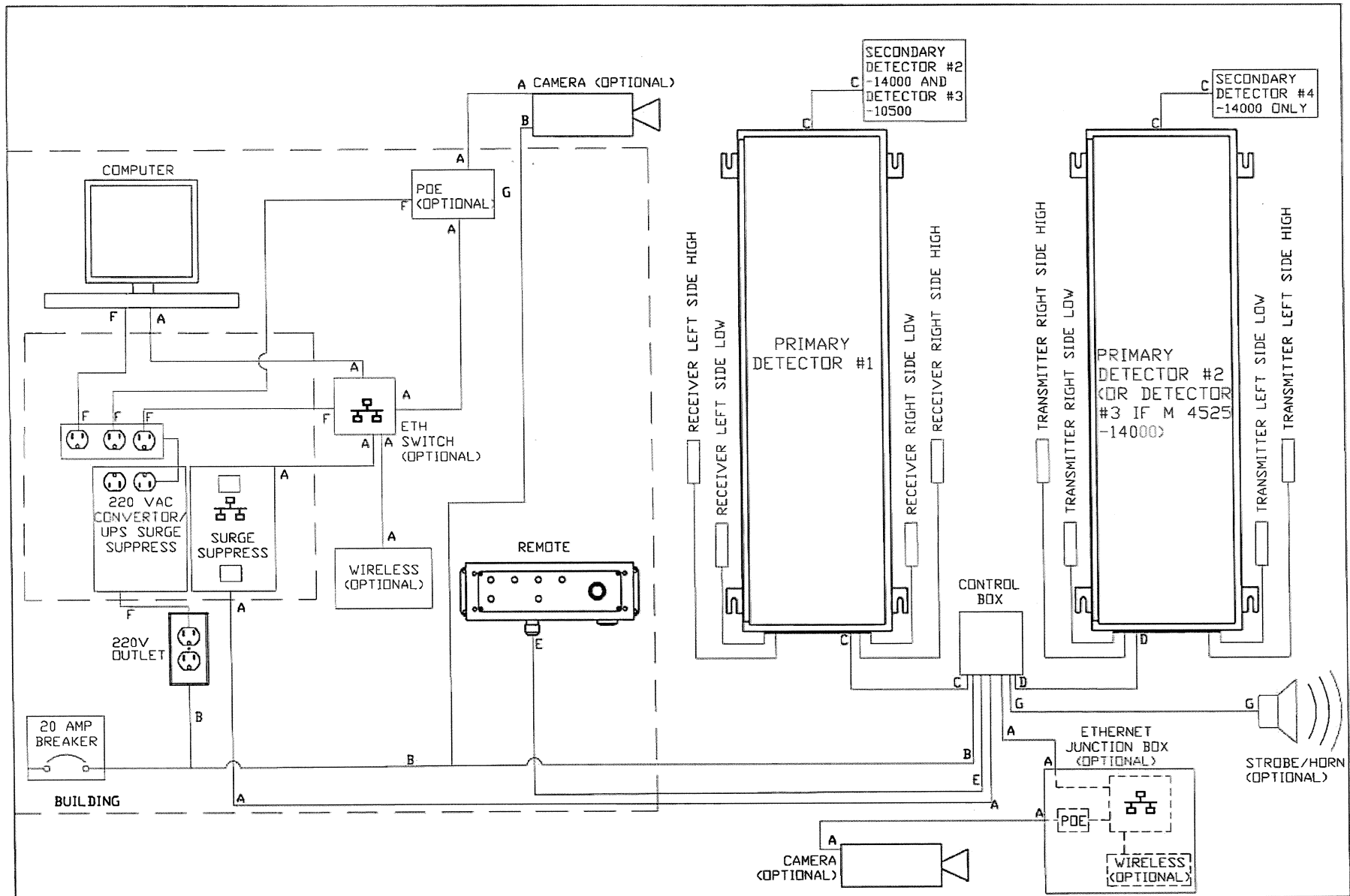
LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 79556	SERIES	SHEET
	511	420



- A = ETHERNET (CAT5E) CABLE (LUDLUM SUPPLIED) (3/4" CONDUIT)
- B = 3 CONDUCTORS OF #12 SOLID (3/4" CONDUIT)
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- E = POWER CORD SUPPLIED WITH DEVICE
- F = DETECTOR CABLE BELDEN 9768 (LUDLUM SUPPLIED) (3/4" CONDUIT)

REV #	ALTERATIONS	DATE	BY
1	VALID	7-23-07	CMC
2	CHANGED CONDUIT FROM 1.5" TO 1" ECF# 2243	10-25-07	RHS
2	ADDED INFO ECF# 2264	12-26-07	RHS
3	ADDED INFO FOR 17500 & 21000	3/5/15	WJM

PART NO: 4511-420			
DWN DATE WJM 3/5/15	CHECKED	APPROVED 46W 3-5-15	
TITLE: M 4525 SERIES BLOCK-NO OPTIONS			
LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 420A



- A = ETHERNET (CAT5E) CABLE (LUDLUM SUPPLIED) (3/4" CONDUIT)
- B = 3 CONDUCTORS OF #12 SOLID (3/4" CONDUIT)
- C = DETECTOR CABLE BELDEN 9768 (LUDLUM SUPPLIED) (3/4" CONDUIT)
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- E = REMOTE CABLE BELDEN 9946 (LUDLUM SUPPLIED) (1" CONDUIT)
- F = POWER CORD SUPPLIED WITH DEVICE
- G = 2 CONDUCTORS OF #14 OR LARGER FOR 12 VDC (3/4" CONDUIT)

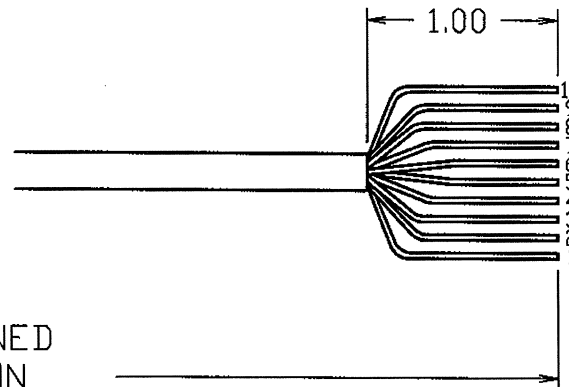
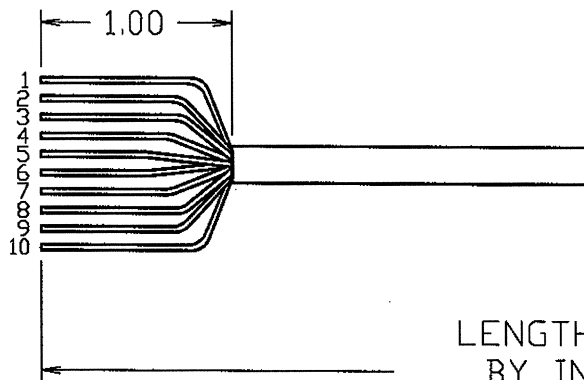
PART NO: 4511-861		
DWN DATE RHS12-26-07	CHECKED	APPROVED <i>New 4-2-12</i>
TITLE: M 4525 SERIES 220V BLOCK-OPTIONS		
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 75556	SERIES 511	SHEET 861

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

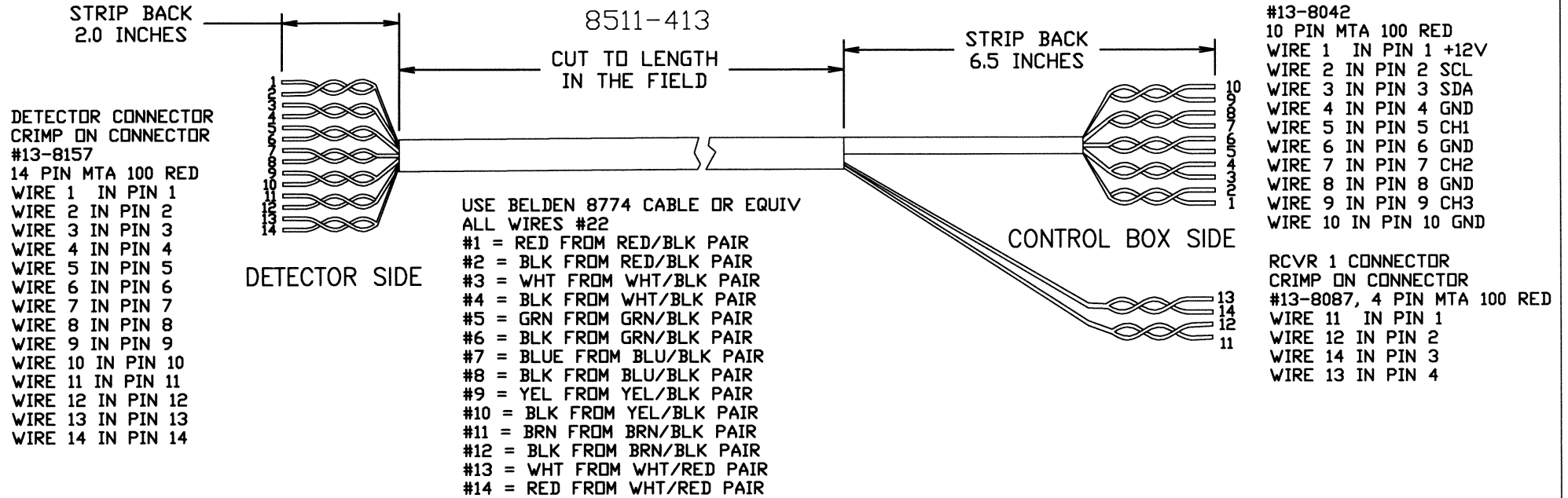
8511-140 IS 100 FT LONG

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

WF

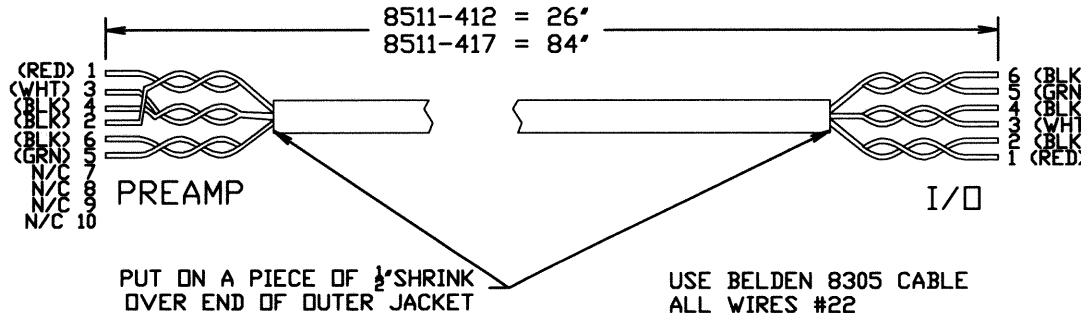
REV #	ALTERATIONS	DATE	BY
1	VALID	7-5-07	JGW
2	BRN/BLK PAIR WAS BRN/RED	10-22-07	JGW
3	4 PIN MTA WAS 2x 3 PIN	07-08-21	DLJ

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'

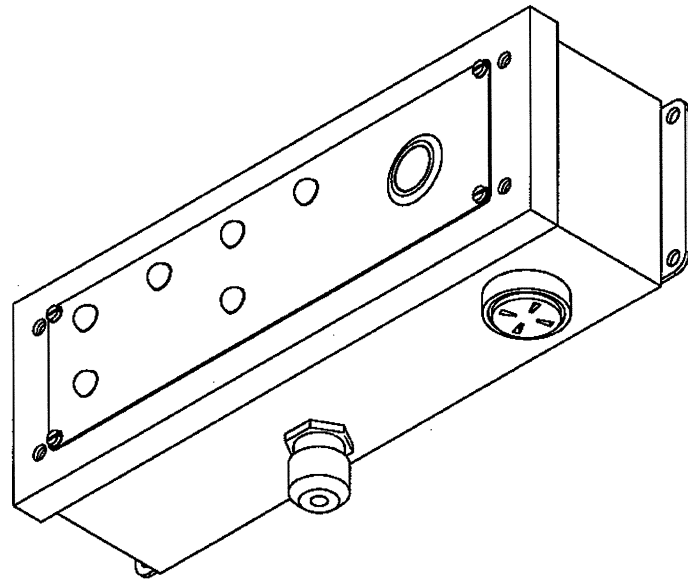
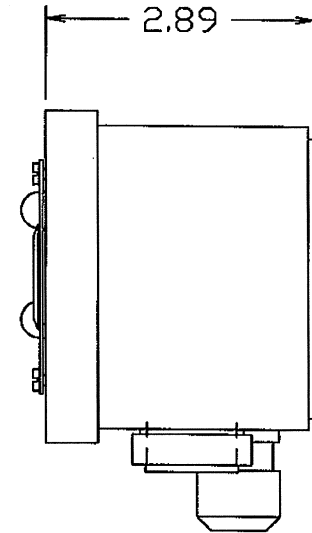
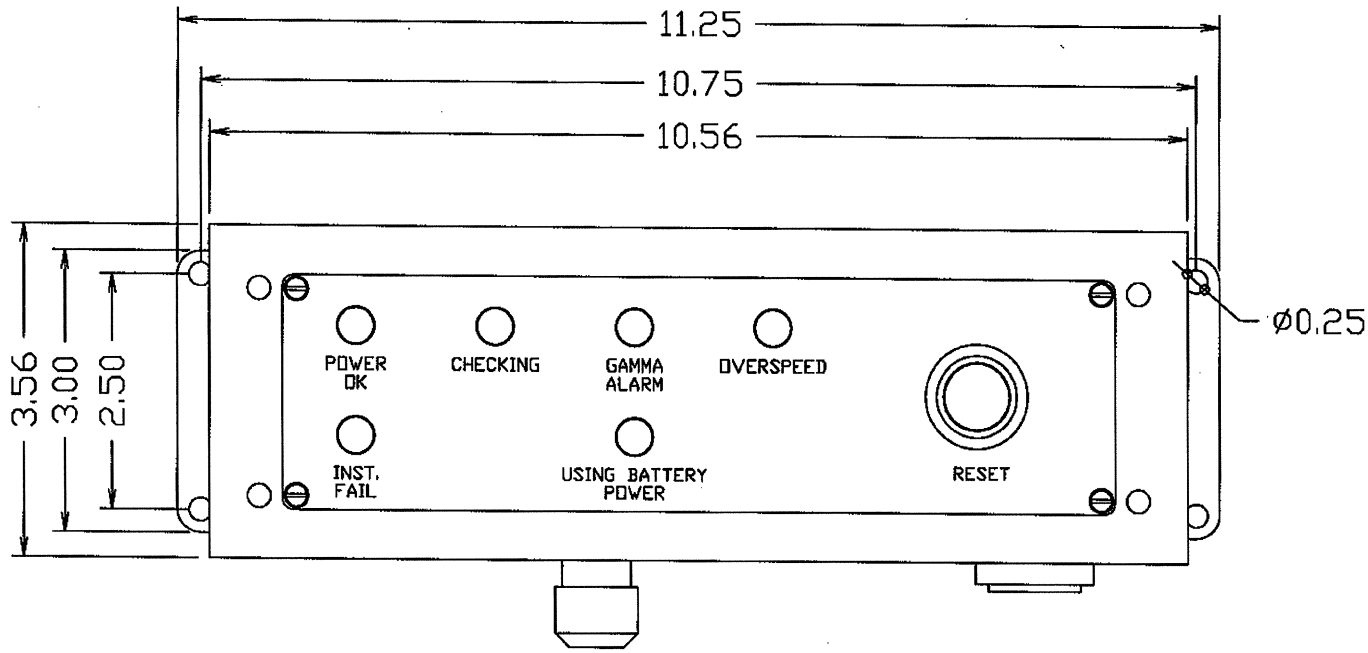


PRIMARY AND SECONDARY
DETECTOR PREAMP CABLE
8511-412 & 8511-417

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

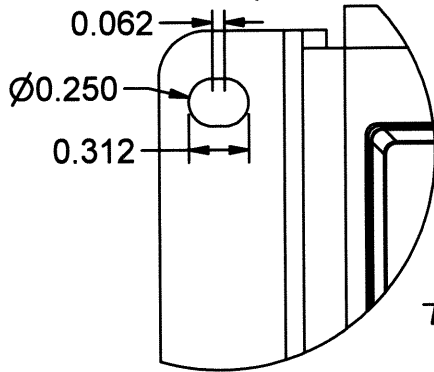
OWN DATE DLJ 07-08-21	CHK DATE	APP DATE JGW 7-8-21
DWG NUM: 8511-413	SCALE: FULL <input type="checkbox"/> OTHER <input type="checkbox"/>	
TITLE: 4525 CONT-PRIM & PREAMP CBL		
LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 75556	SERIES 511	SHEET 413

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

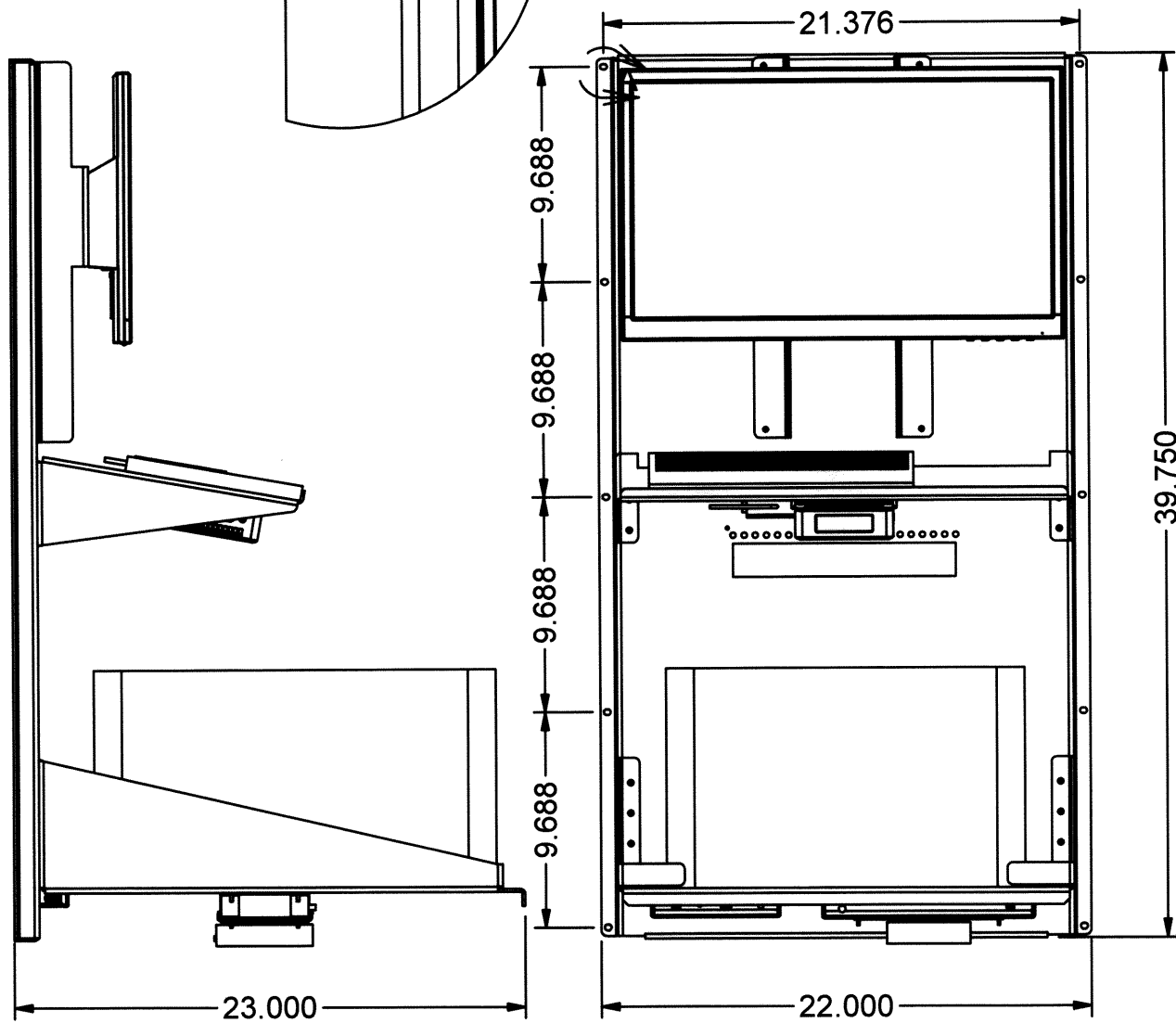


DRN	DATE	CHK	DATE	APP	DATE
CLW	01-04-05				1-4-05
DWG NUM	4511-207	SCALE	FULL <input type="checkbox"/>	OTHER	
TITLE M 4525 REMOTE					
LUDLUM MEASUREMENTS, INC. 901 DWK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			511	207A	

TYPICAL MOUNT
SLOT (10 PLACES)

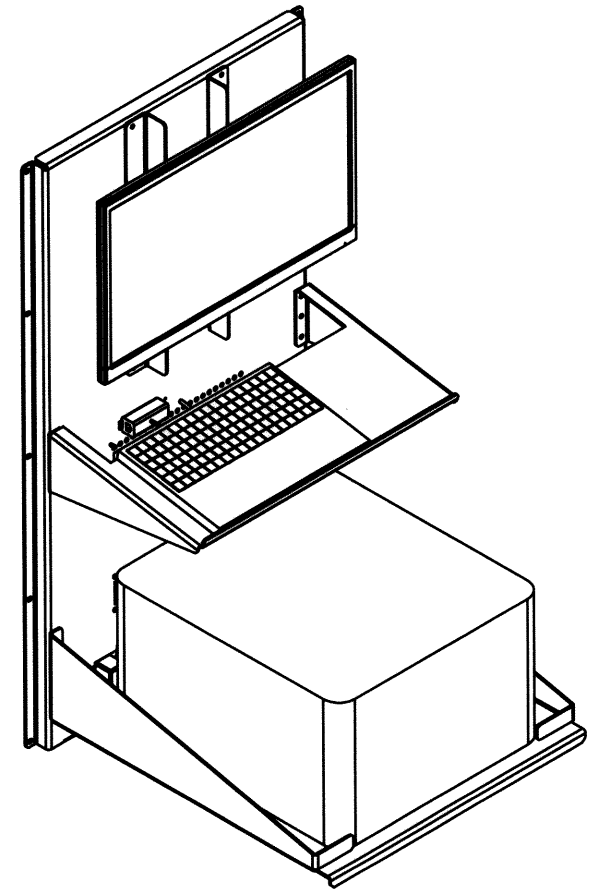


DETAIL A
SCALE 1 : 1



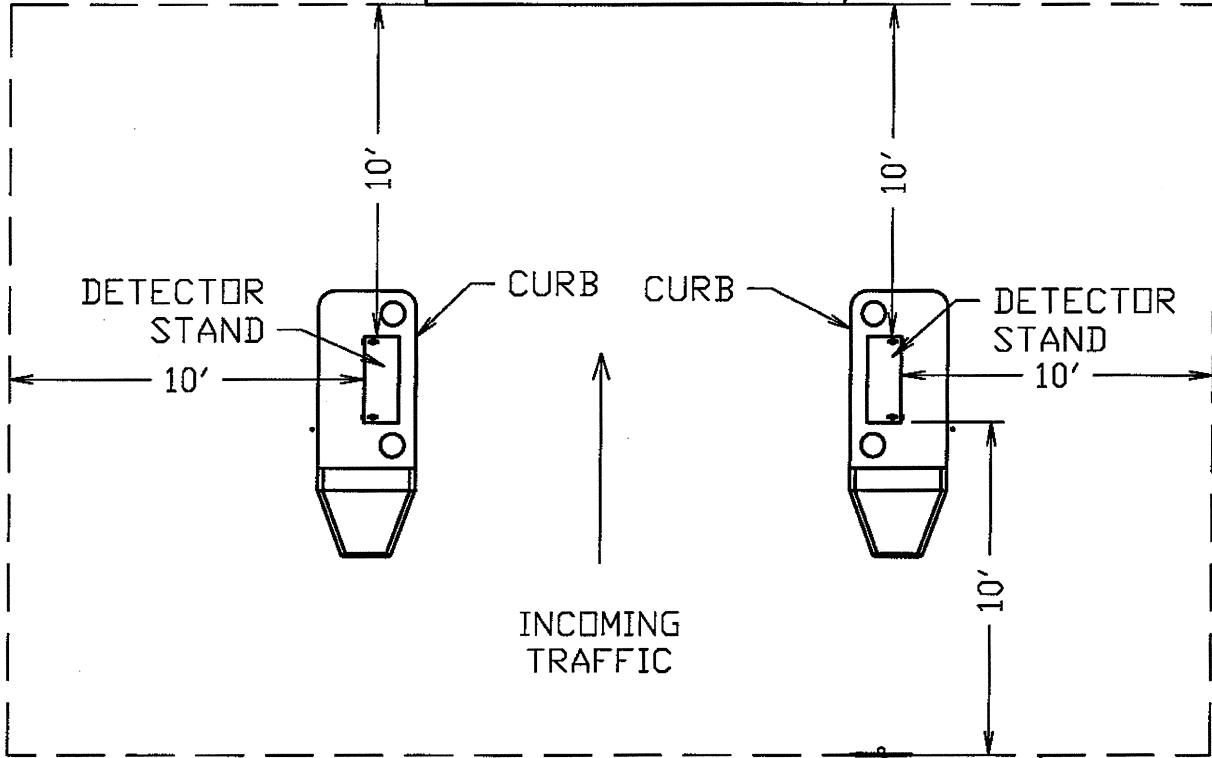
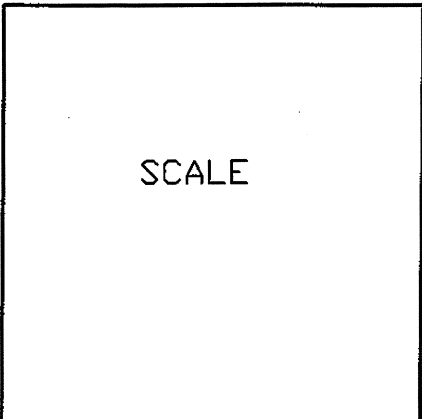
REVISION HISTORY

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

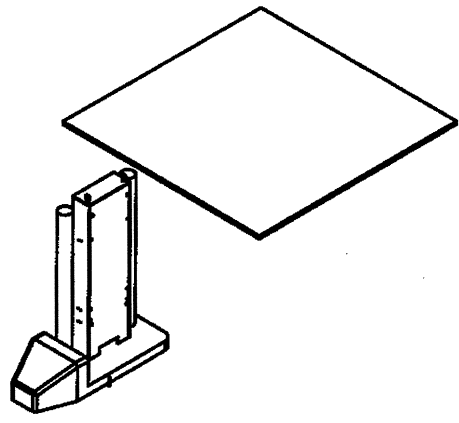
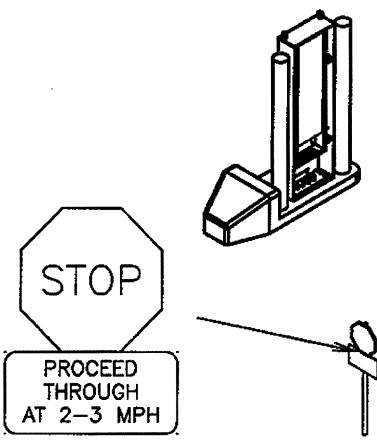


DWN	DATE	CHK	DATE	APP	DATE
CMC	7-23-21	JGW	7-23-21		
DWG NUM: 4396-850				SCALE: 1/8	
TITLE 4525 COMPUTER ASSEMBLY					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES	SHEET		
		396	850		

REV #	ALTERATIONS	DATE	BY
1	VALID	3-21-07	CMC

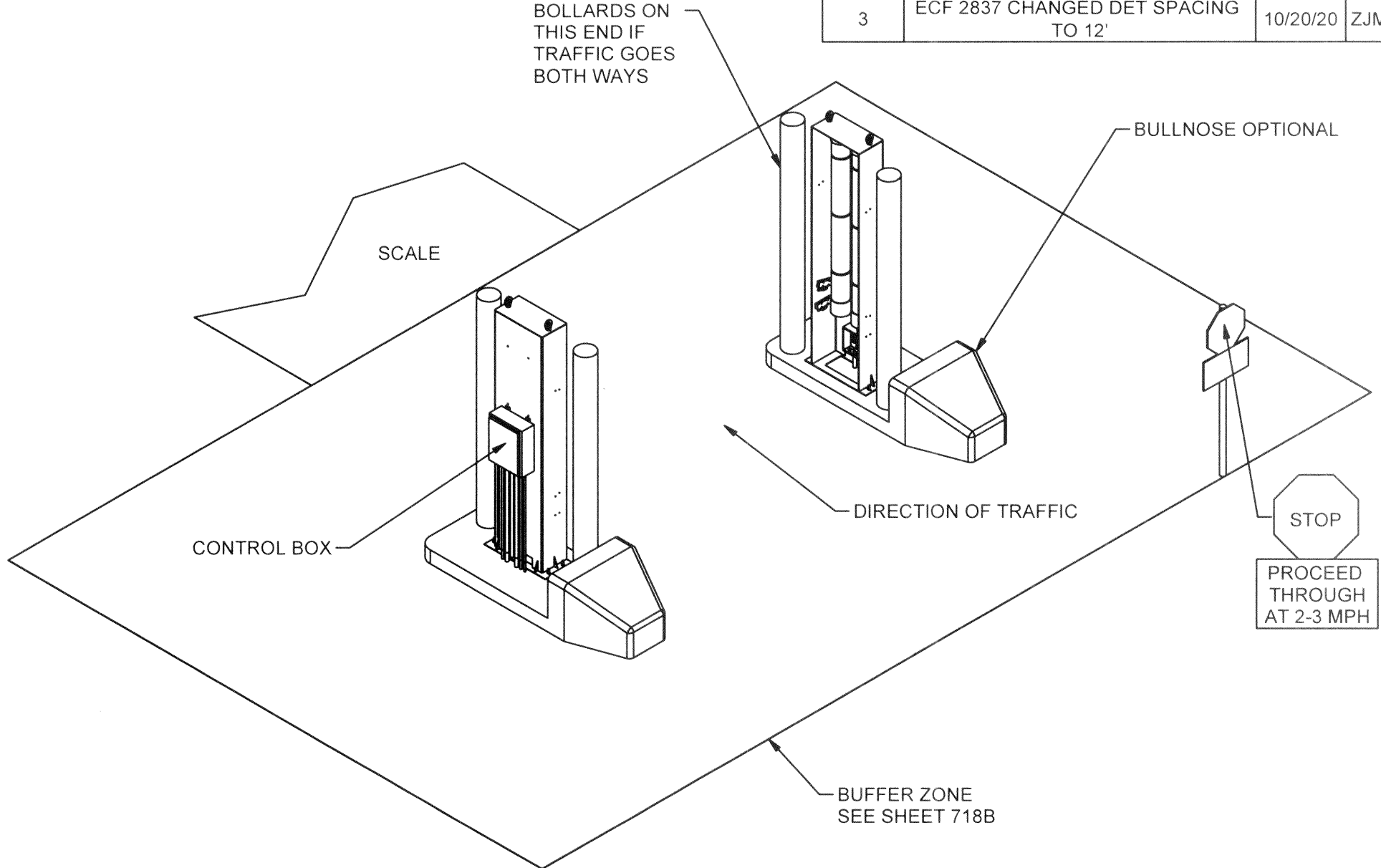


NO PARKING ZONE
STOP SIGN




DWN DATE	CMC	3-21-07	CHK DATE		APP DATE	3/21/07
DWG NUM	4384-1054		SCALE	FULL TO OTHER		
TITLE M 4525 BUFFER ZONE						
LUDLUM MEASUREMENTS, INC. 500 DAK STREET EVANSHAW, TEXAS 75036			SERIES	384		SHEET
					1054	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2/9/12	MSC
2	ADDED ACTIVE AREA	10/1/15	JGW
3	ECF 2837 CHANGED DET SPACING TO 12'	10/20/20	ZJM



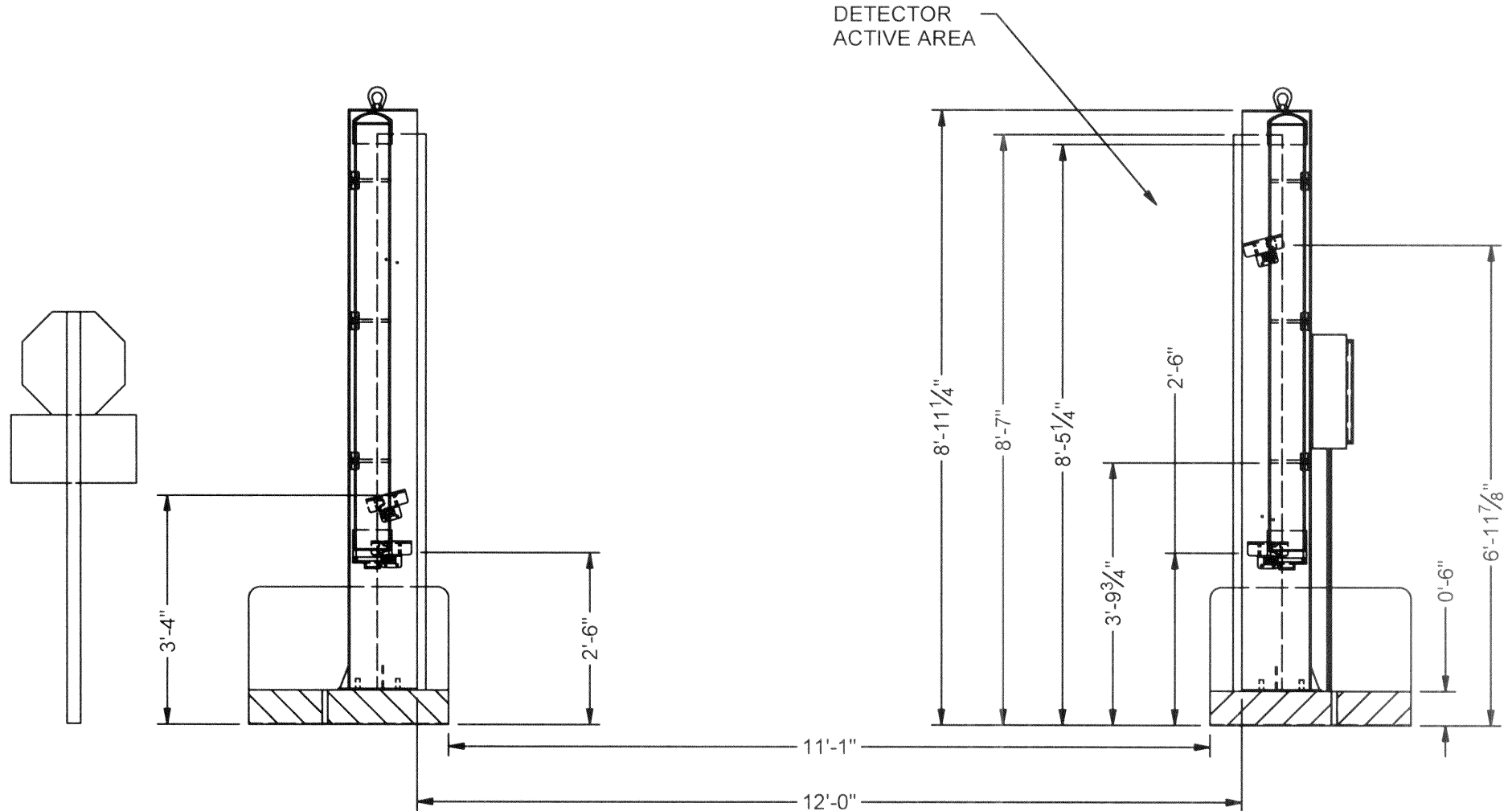
ALL DIMENSIONS ARE SUBJECT TO CHANGE
DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 718A, 718B, 718C, 718D, 718E

DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/19/2020			<i>ZJM</i>	11-19-20
DWG NUM: 4511-718				SCALE: --	
TITLE M 4525-2400 TYPICAL INSTALL					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES	SHEET		
		511	718		

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
 EVERYTHING SHOULD BE MOVED UP BY
 18" AND ONLY TOP IR SENSORS ARE USED.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2/9/12	MSC
2	ADDED ACTIVE AREA	10/1/15	JGW
3	ECF 2837 CHANGED DET SPACING TO 12'	10/20/20	ZJM

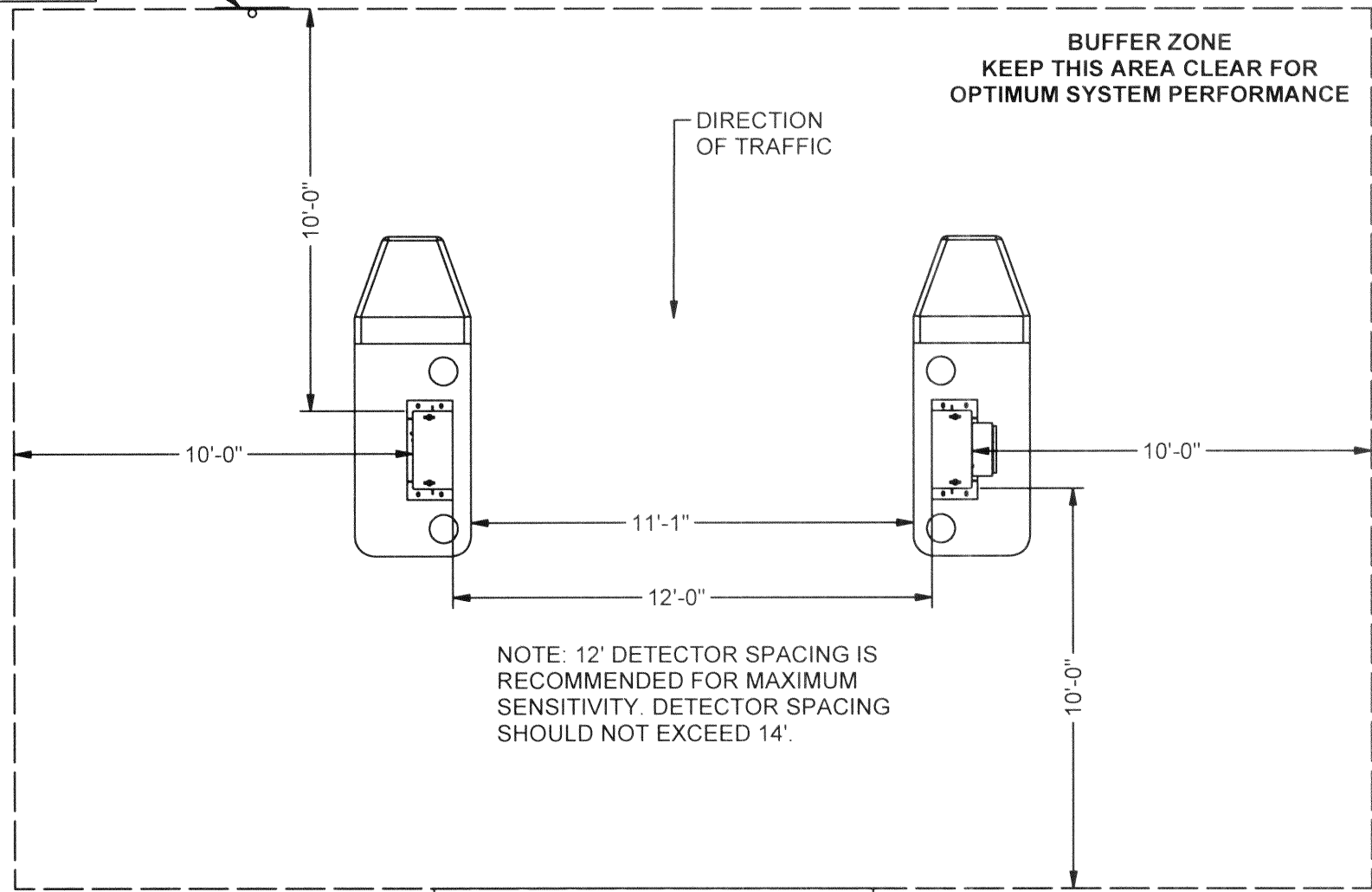


NOTE: 12' SPACING FOR MAX
 SENSITIVITY. SPACING SHOULD
 NOT EXCEED 14'.
 (SEE SHEET 718B)

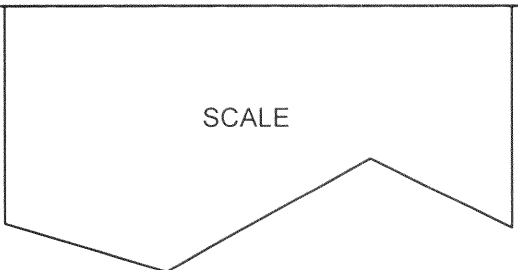
ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS,
 SEE SHEETS 718, 718B, 718C, 718D, 718E

DWN ZJM	DATE 11/19/2020	CHK	DATE	APP JGW	DATE 11-19-20
DWG NUM: 4511-718				SCALE: 1/40	
TITLE M 4525-2400 DET. ELEVATION					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 718A		

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2/9/12	MSC
2	ADDED ACTIVE AREA	10/1/15	JGW
3	ECF 2837 CHANGED DET SPACING TO 12'	10/20/20	ZJM



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



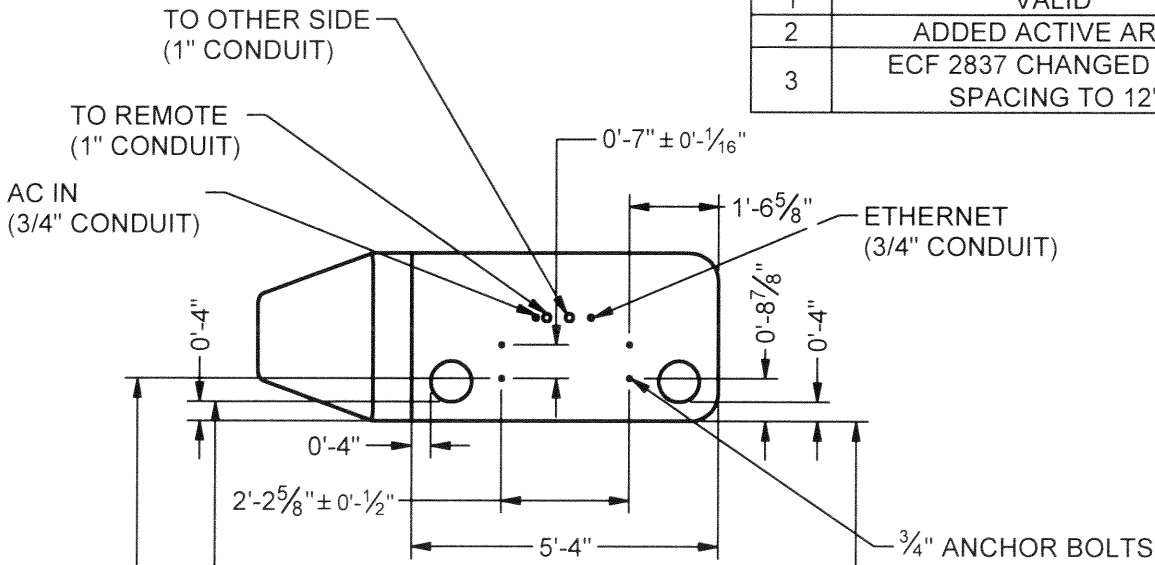
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 718, 718A, 718C, 718D, 718E

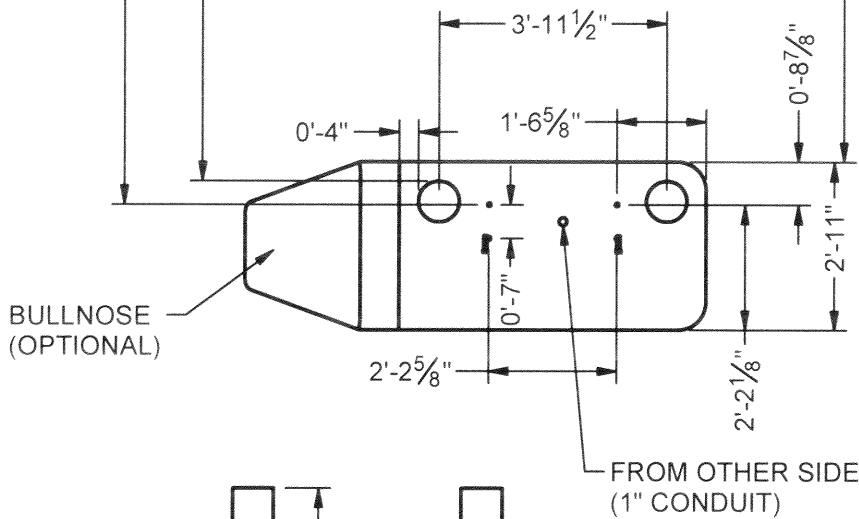
DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/19/2020			JGW	11-19-20
DWG NUM: 4511-718				SCALE: --	
TITLE M 4525-2400 AERIAL VIEW					
LUDLUM MEASUREMENTS, INC. <small>901 OAK STREET SWEETWATER, TEXAS 79556</small>			SERIES 511	SHEET 718B	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	2/9/12	MSC
2	ADDED ACTIVE AREA	10/1/15	JGW
3	ECF 2837 CHANGED DET SPACING TO 12'	10/20/20	ZJM



NOTE: SEE SHEET 718B FOR DETECTOR SPACING OR 375B FOR M 4525-7000



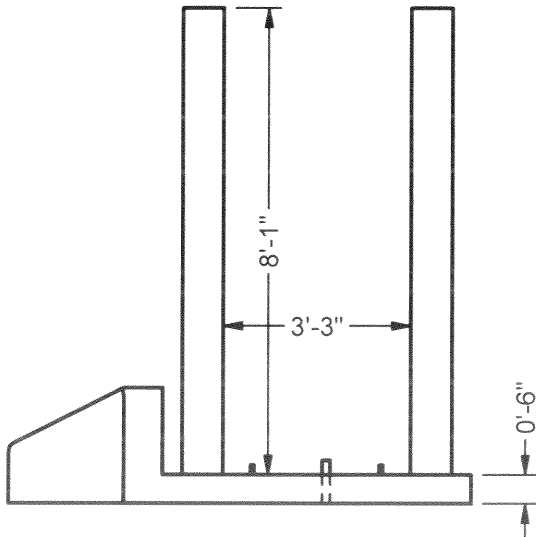
SEE SHEET 511X836(A) FOR CONCRETE AND ANCHOR BOLT DETAILS.

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

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE, EVERYTHING SHOULD BE MOVED UP BY 18" AND ONLY TOP IR SENSORS USED.

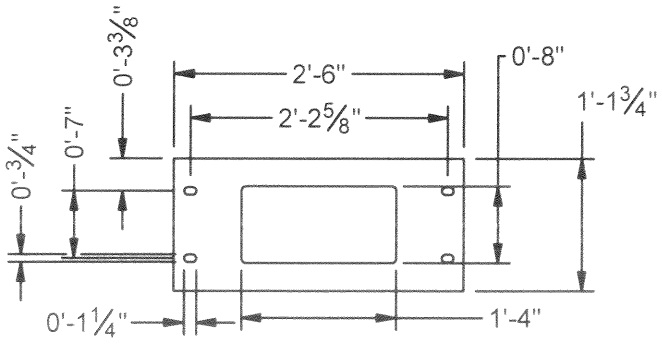
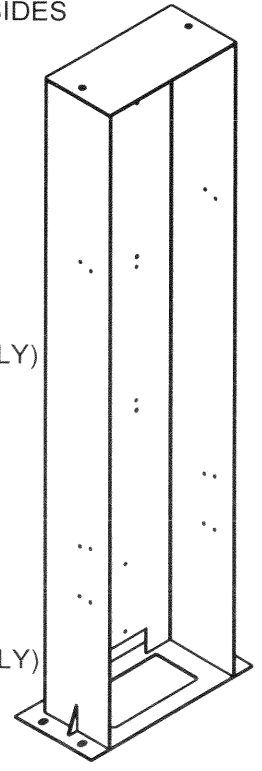
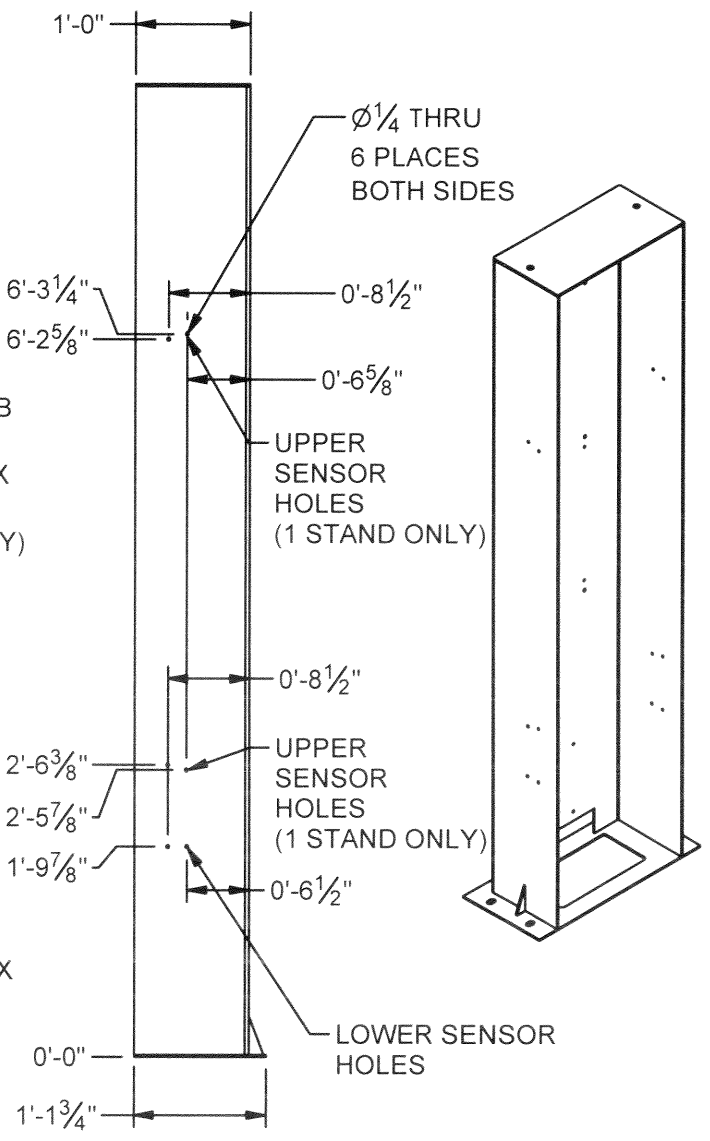
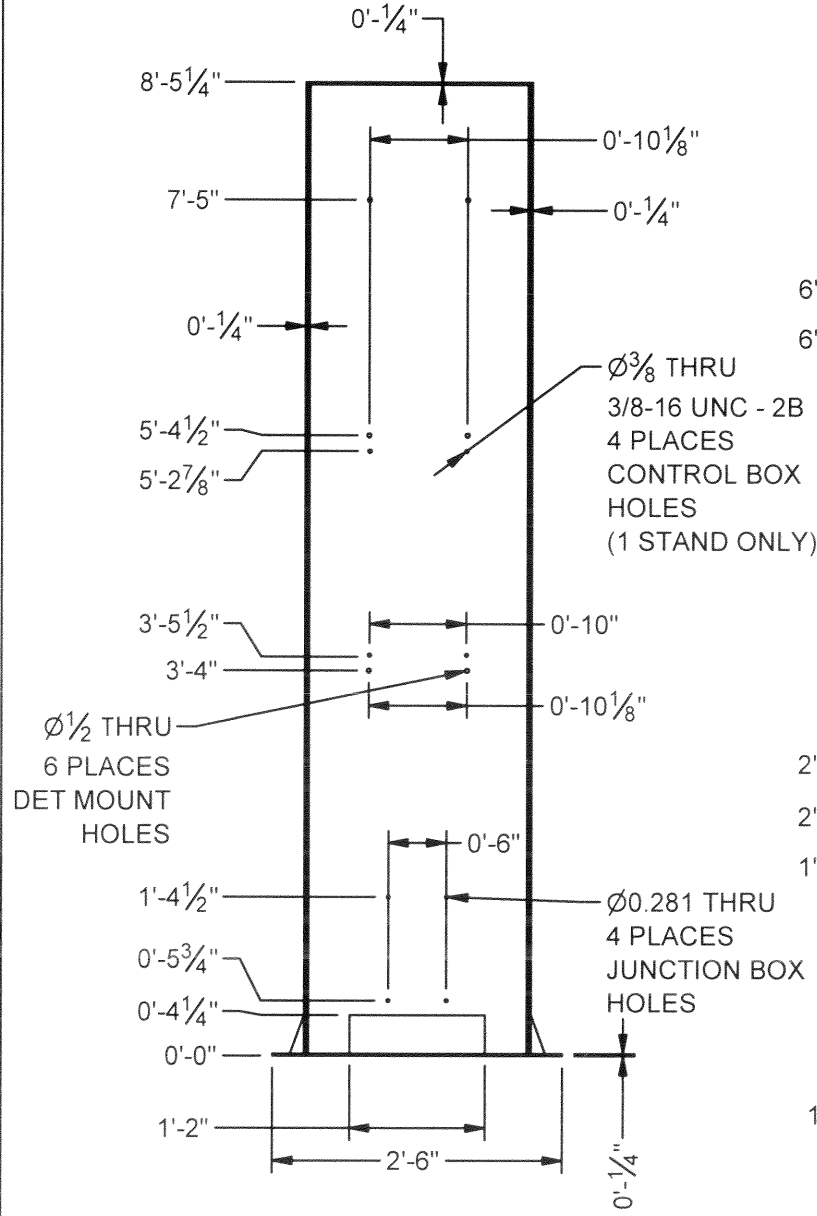
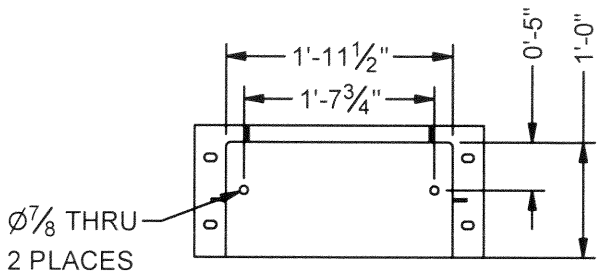
SEE SHEETS 718, 718A, 718B, 718D, 718E OR 375, 375A, 375B, 375C FOR M 4525-7000



DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/18/2020			Jaw	12-18-20
DWG NUM: 4511-718				SCALE: 1/40	
TITLE M 4525-2400, 7000 PLAN VIEW					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 718C	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	2/9/12	MSC
2	ADDED ACTIVE AREA	10/1/15	JGW
3	ECF 2837 CHANGED DET SPACING TO 12'	10/20/20	ZJM

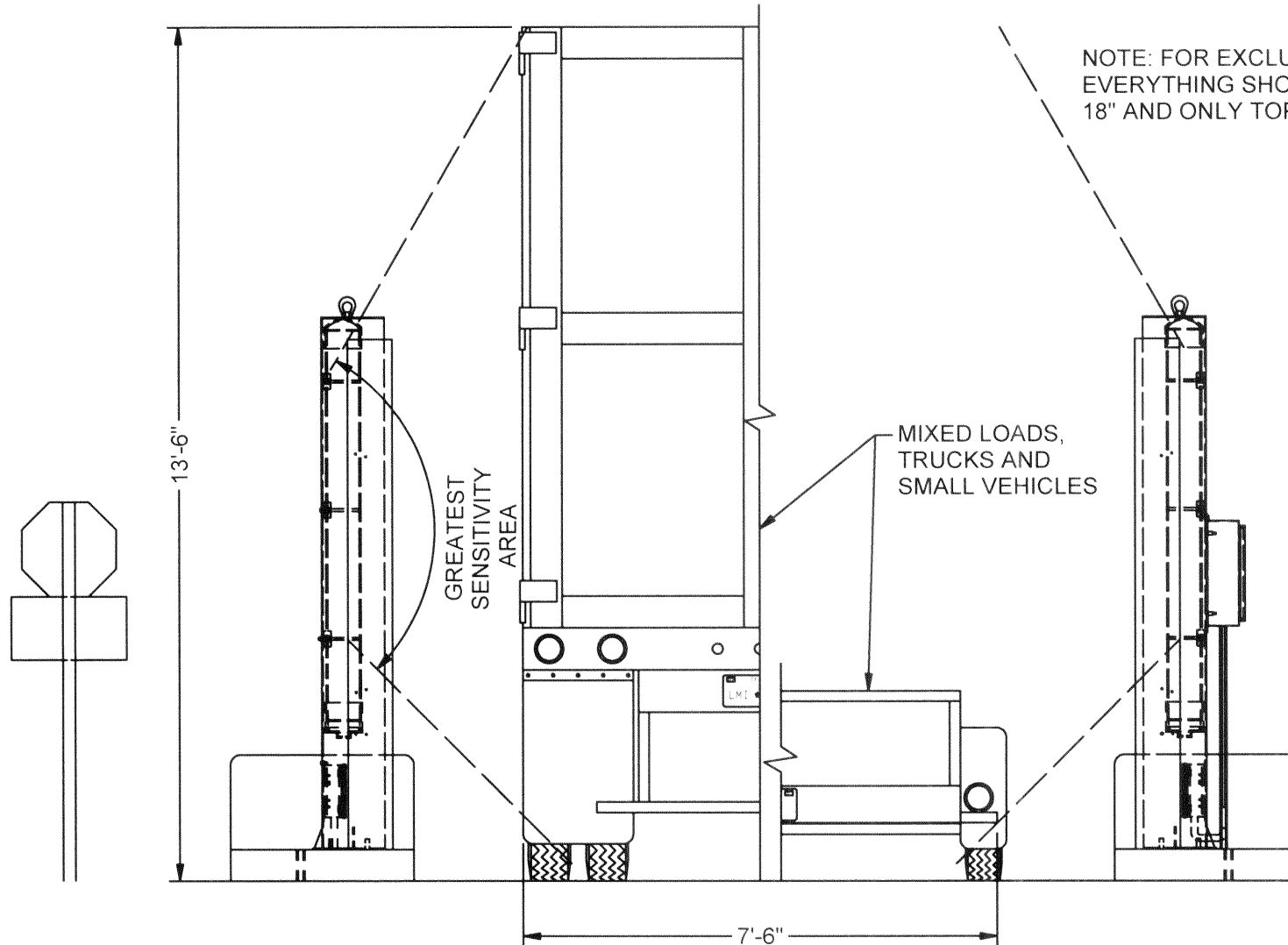


DWN	DATE	CHK	DATE	APP	DATE
ZJM	11/19/2020			JGW	11-19-20
DWG NUM: 4511-718				SCALE: 1/20	
TITLE M 4525-2400 STEEL CONSTRUCT					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 718D	

ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS.


SEE SHEETS 718, 718A, 718B, 718C, 718D

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	2/9/12	MSC
2	ADDED ACTIVE AREA	10/1/15	JGW
3	ECF 2837 CHANGED DET SPACING TO 12'	10/20/20	ZJM

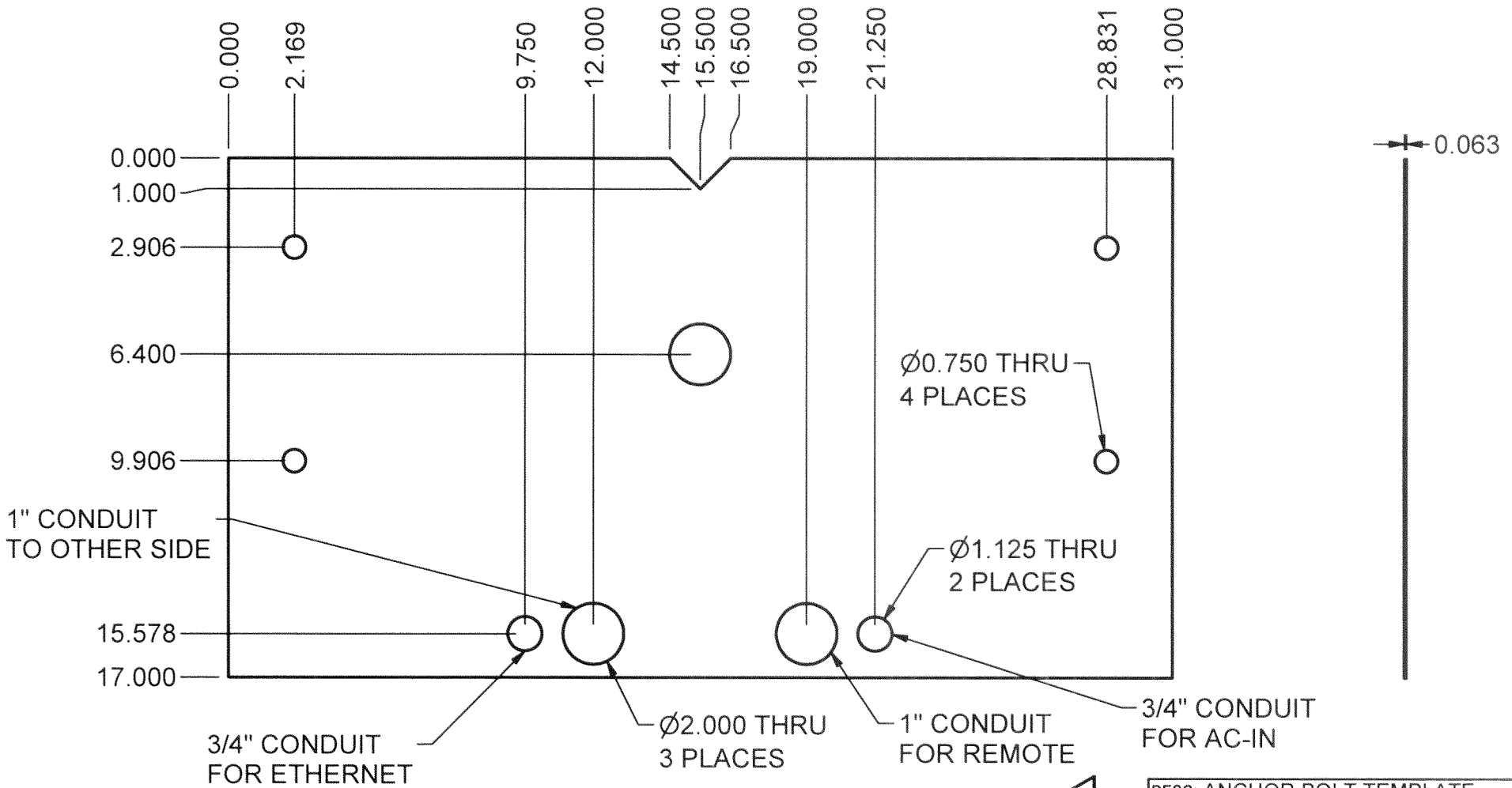


NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
 EVERYTHING SHOULD BE MOVED UP BY
 18" AND ONLY TOP IR SENSORS ARE USED.

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

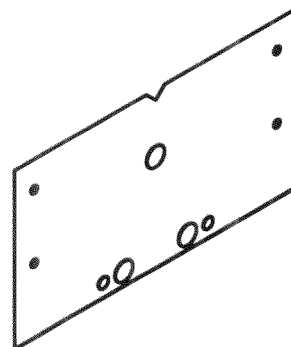
DWN	DATE	CHK	DATE	APP	DATE
ZJM	12/2/2020			<i>JGW</i>	12-2-20
DWG NUM: 4511-718				SCALE: --	
TITLE M 4525-2400 SENSITIVE AREA					
 LUDLUM MEASUREMENTS, INC. <small>501 OAK STREET SWEETWATER, TEXAS 79556</small>			SERIES 511	SHEET 718E	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	3-28-08	JGW
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.: 4525-7000	PART NO.: 7511-461-01		
MAT'L: 16 GA HOT DIPPED GALVANIZED			
MAT'L. NO.: 37-9820	SIZE: 527 SI		
SAND CLASS: ---	PAINT CLASS: ---	COVERAGE CLASS: ---	
FINISH: CLEAN, DON'T SAND NO. REQ'D: 2			
FINAL ASSY NO.: ---			SILK SCREEN: N
DWN	DATE	CHK	DATE
ZJM	9/22/2020		
APP	DATE		
JGW	9-22-20		
TOLERANCES		SCALE: 1/5	
UNLESS NOTED OTHERWISE			
MILL, LATHE, SHEETMETAL = ± 0.005		ANGLES = ± 0.5°	
BENDS ON SHEETMETAL PARTS = ± 0.010			
ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE			
LUDLUM MEASUREMENTS, INC. 301 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 461

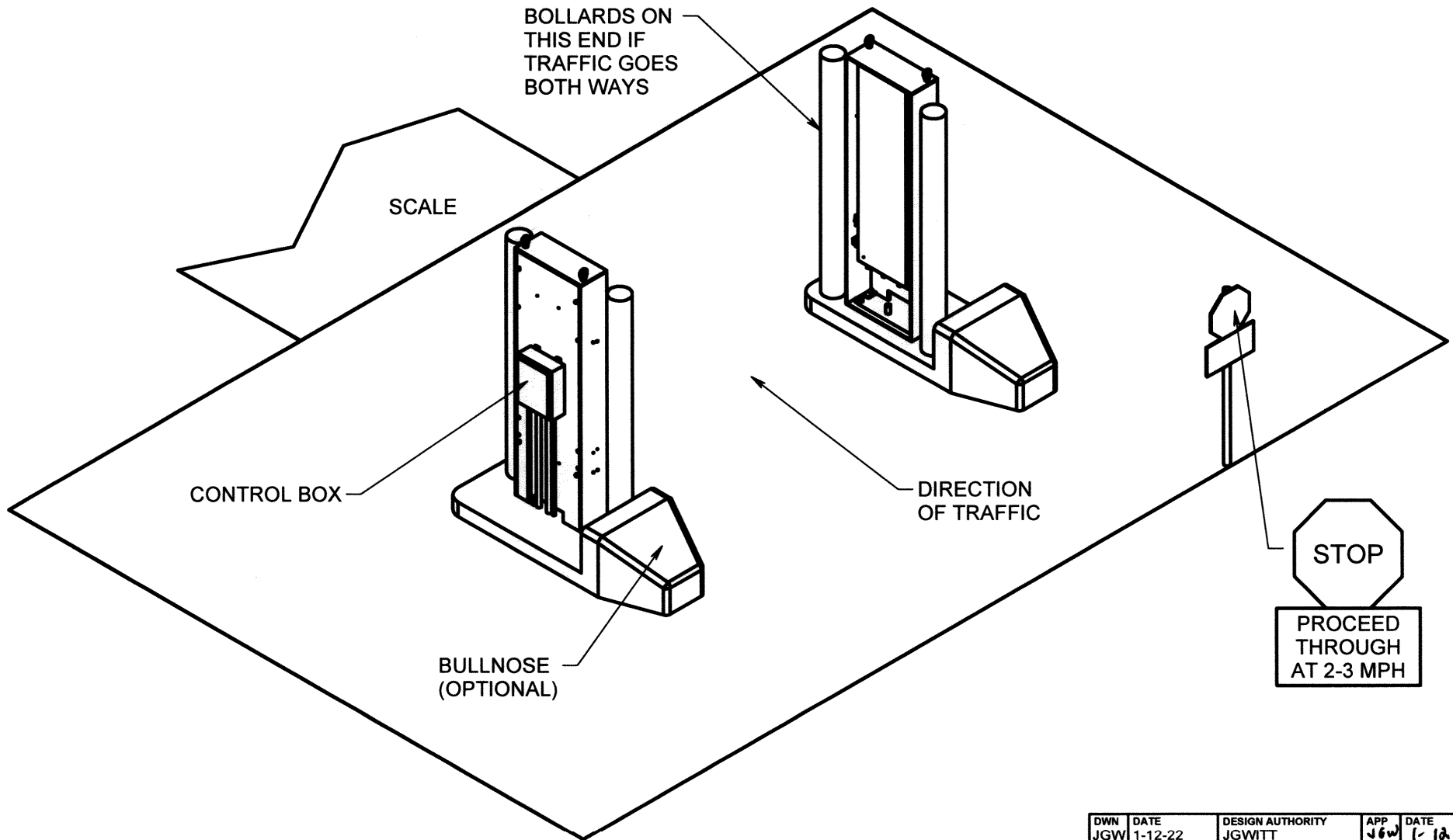
ALL DIMENSIONS ARE SUBJECT TO CHANGE
DEPENDING ON SITE REQUIREMENTS

SEE SHEETS 375A, 375B, 375C, 375D

SEE SHEET 511 X 718C FOR THE CONCRETE
PLAN VIEW

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	4-17-07	JGW
2	ECF2264 ADDED HOLES FOR OPTION BOX	12-26-07	RHS
3	ECF2837 12' DETECTOR SPACING WAS 14'	10-16-20	ZJM



DWN JGW	DATE 1-12-22	DESIGN AUTHORITY JGWITT	APP JGW	DATE 1-12-22
DWG NUM: 4511-375			SCALE: --	
TITLE: M 4525-7000 TYPICAL INSTALL				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 375	

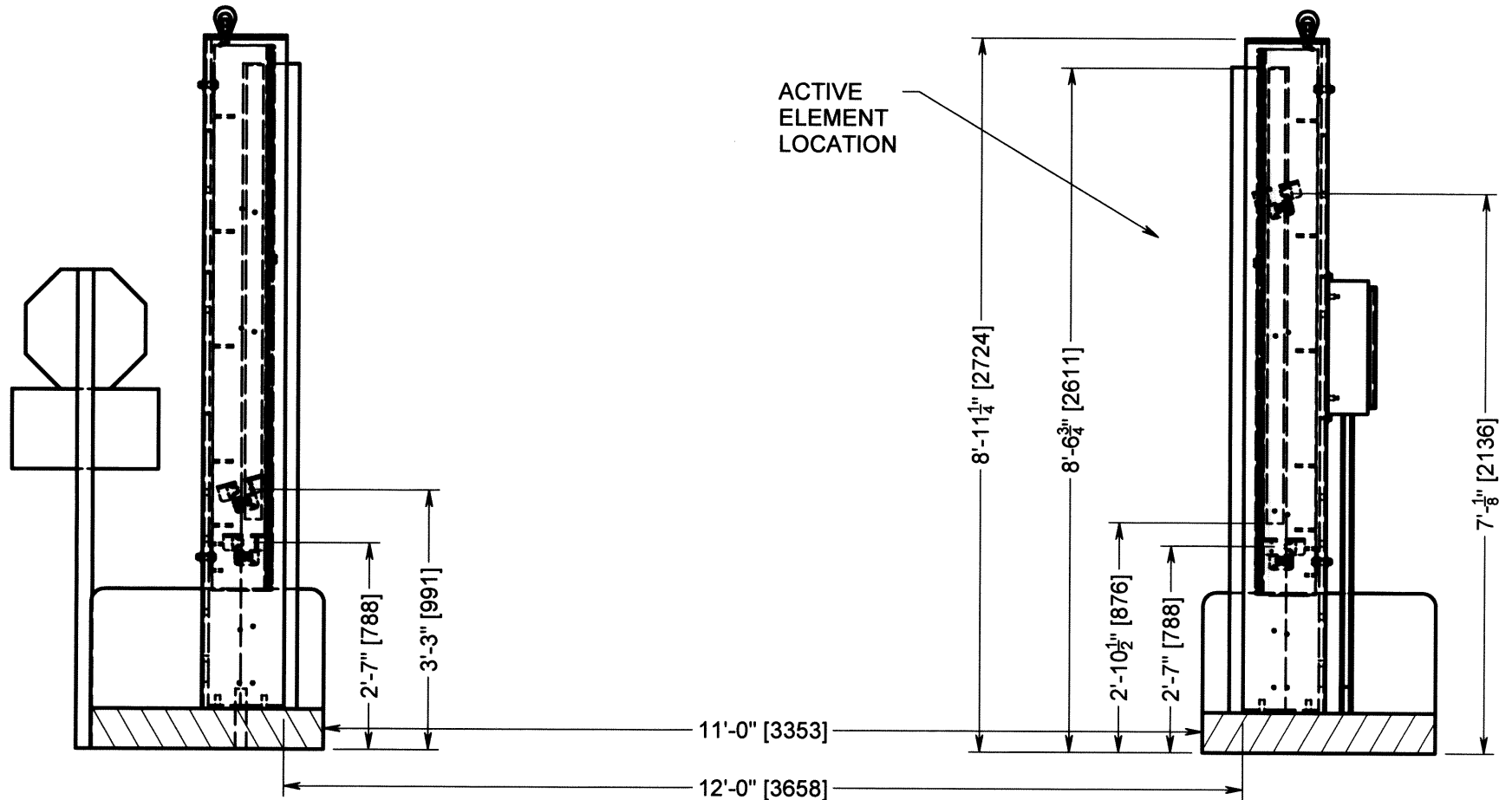
ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS

SEE SHEETS 375, 375B, 375C, 375D

SEE SHEET 511 X 718C FOR THE CONCRETE
 PLAN VIEW

REVISION HISTORY

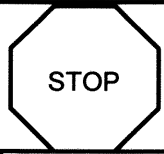
REV	DESCRIPTION	DATE	BY
1	VALID	4-17-07	JGW
2	ECF #2264 ADDED HOLES FOR OPTION BOX	12-26-07	RHS
3	ECF #2837 DET SPACING TO 12'	10-16-20	ZJM



NOTE: 12' SPACING FOR MAX
 SENSITIVITY. SPACING SHOULD
 NOT EXCEED 14' [4267].
 (SEE SHEET 375B)

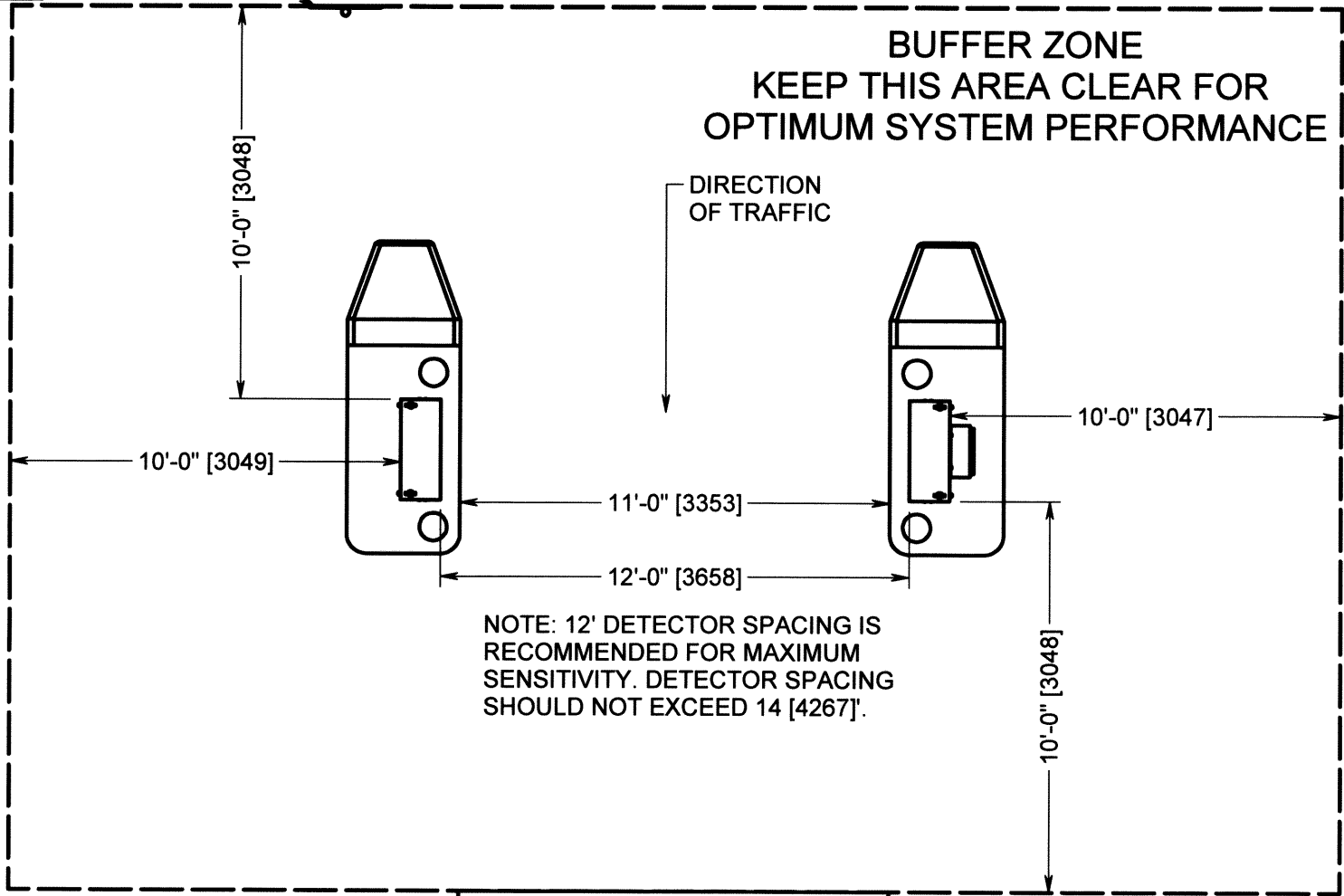
NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
 EVERYTHING SHOULD BE MOVED UP BY
 18" AND ONLY TOP IR SENSORS ARE USED.

DWN ROH	DATE 9-8-22	DESIGN AUTHORITY JGWITT	APP JGW	DATE 9-9-22
DWG NUM: 4511-375			SCALE: --	
TITLE: M4525-7000 DET ELEVATION				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 375A	



PROCEED THROUGH AT 2-3 MPH

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	4-17-07	JGW
2	ECF2264 ADDED HOLES FOR OPTION BOX	12-26-07	RHS
3	ECF #2837 CHANGED DET SPACING TO 12'	12-2-20	ZJM



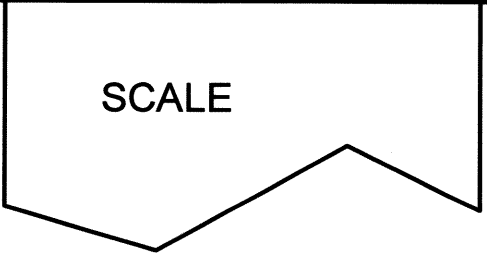
BUFFER ZONE
KEEP THIS AREA CLEAR FOR
OPTIMUM SYSTEM PERFORMANCE

NOTE: 12' DETECTOR SPACING IS RECOMMENDED FOR MAXIMUM SENSITIVITY. DETECTOR SPACING SHOULD NOT EXCEED 14 [4267].

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS

SEE SHEETS 375, 375A, 375C, 375D

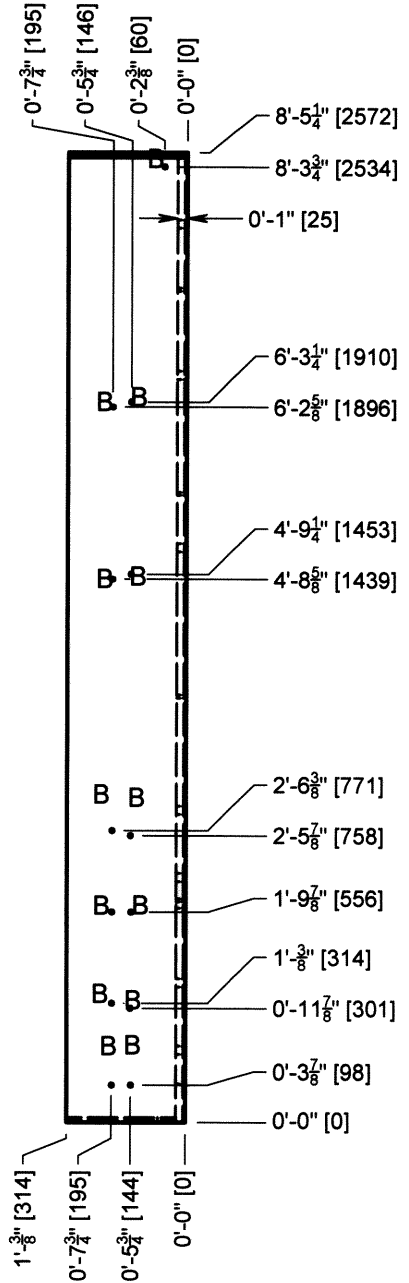
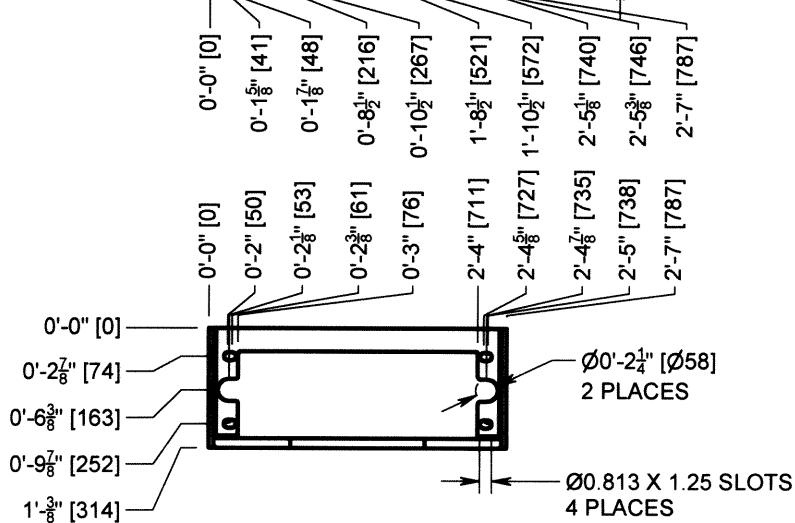
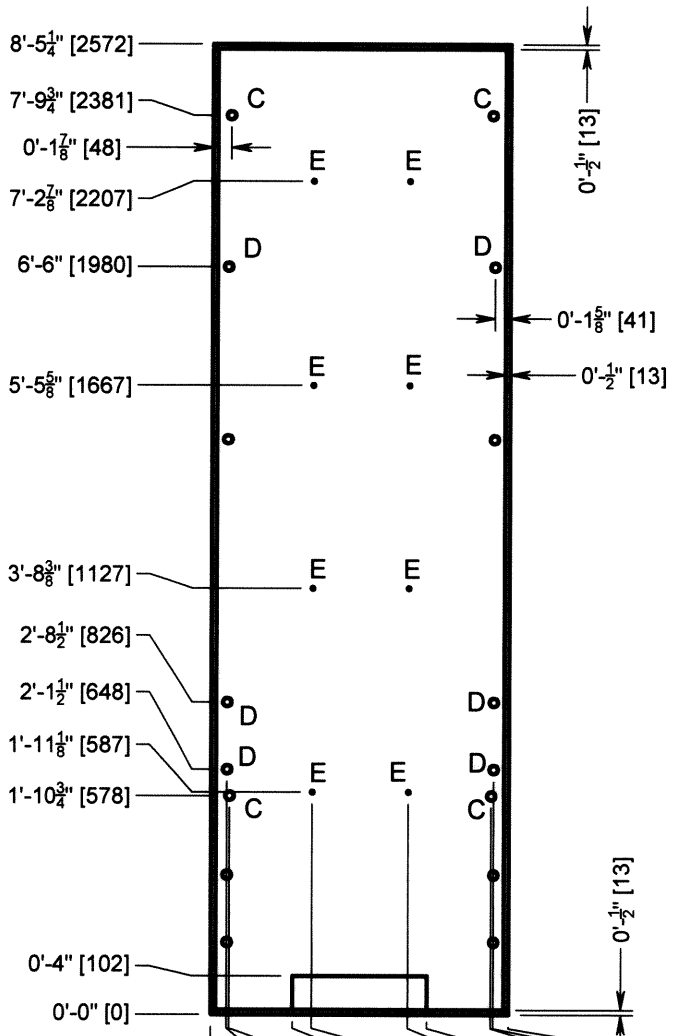
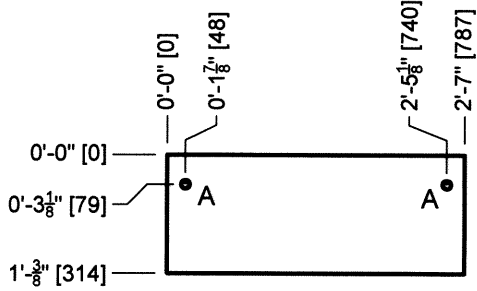
SEE SHEET 511 X 718C FOR THE CONCRETE PLAN VIEW



DWN	DATE	DESIGN AUTHORITY	APP	DATE
ROH	9-8-22	JGWITT	JGW	9-9-22
DWG NUM: 4511-375			SCALE: --	
TITLE: M4525-7000 AERIAL VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES	SHEET	
		511	375B	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	4-17-07	JGW
2	ECF2264 ADDED HOLES FOR OPTION BOX	12-26-07	RHS
3	ECF2837 12' DET SPACING WAS 14'	10-16-20	ZJM
4	ECF# 3311	6-24-22	CMC



A = Ø0.875 FOR LIFTING LUG
 B = Ø0.312 FOR SENSOR MOUNTING ON BOTH SIDES OF BOX
 C = Ø0.875 FOR DETECTOR MOUNT
 D = Ø0.875 FOR SENSOR VIEWING
 E = Ø3/8-16 FOR CONTROL BOX AND OPTION BOX

DWN	DATE	DESIGN AUTHORITY	APP	DATE
ROH	9-8-22	B MILLER	JGW	9-9-22
DWG NUM: 4511-375			SCALE: --	
TITLE: M4525-7000 STEEL CONSTRUCT				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 375C	

ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS

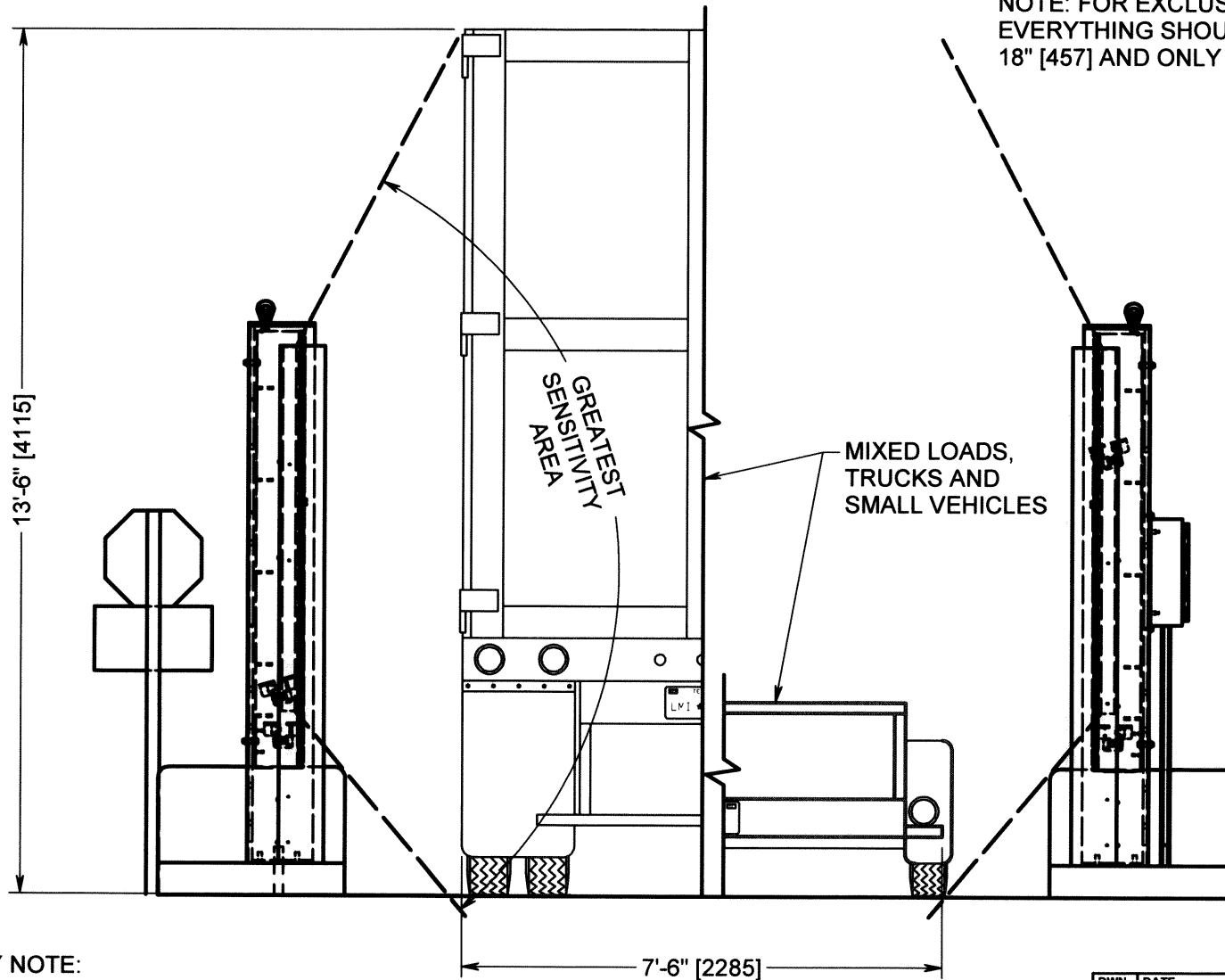
SEE SHEETS 375A, 375B, 375C, 375D

SEE SHEET 511 X 718C FOR THE CONCRETE
 PLAN VIEW

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	4-17-07	JGW
2	ECF2264 ADDED HOLES FOR OPTION BOX	12-26-07	RHS
3	ECF #2837 CHANGED DET SPACING TO 12'	12-2-20	ZJM

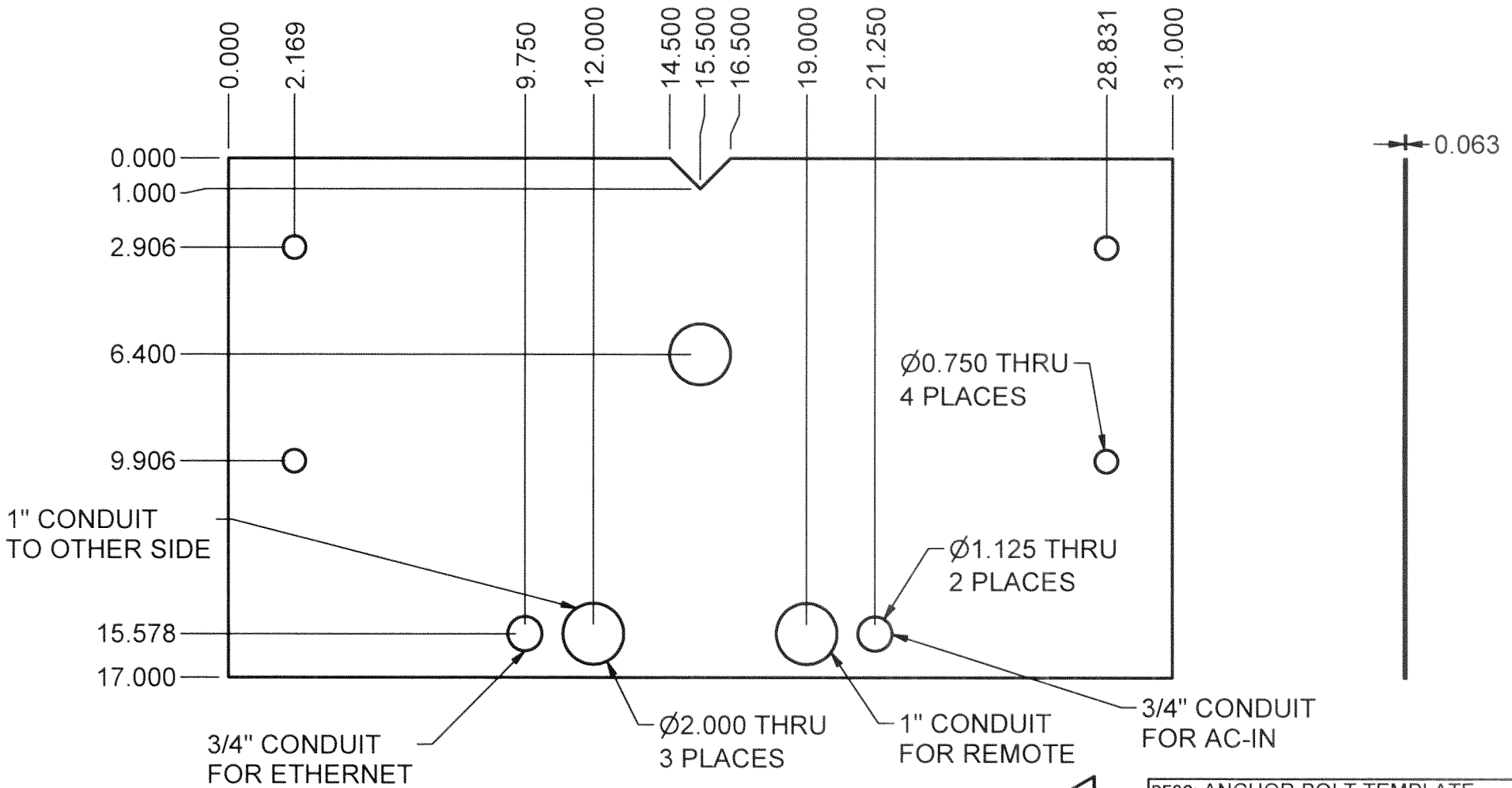
NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
 EVERYTHING SHOULD BE MOVED UP BY
 18" [457] AND ONLY TOP IR SENSORS ARE USED.



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

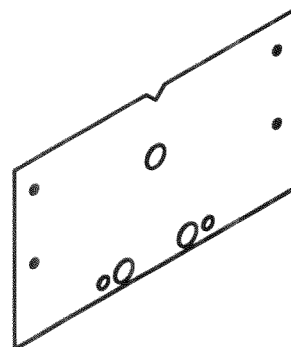
DWN	DATE	DESIGN AUTHORITY	APP	DATE
ROH	9-8-22	JGWITT	JGW	9-9-22
DWG NUM: 4511-375			SCALE: --	
TITLE: M4525-7000 SENSITIVE AREA				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 375D	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	3-28-08	JGW
2	ECF 5688 CHANGED PN#	9-21-20	ZJM



DO NOT SAND

NOTE:
NOTCH IS FRONT
OF STAND FACING
TRAFFIC LANE.



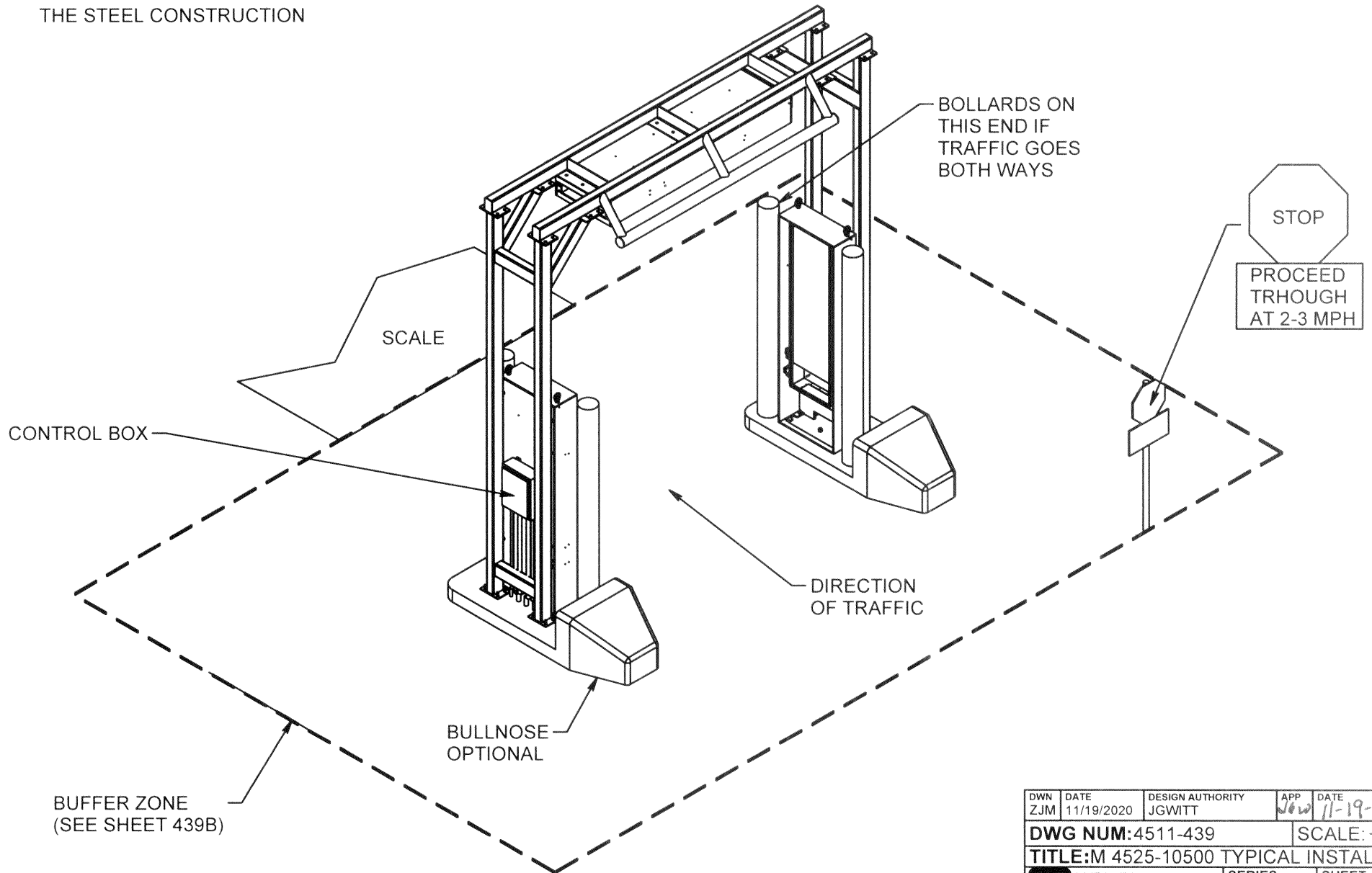
DESC: ANCHOR BOLT TEMPLATE			
MODEL NO.: 4525-7000	PART NO.: 7511-461-01		
MAT'L.: 16 GA HOT DIPPED GALVANIZED			
MAT'L. NO.: 37-9820	SIZE: 527 SI		
SAND CLASS: ---	PAINT CLASS: ---	COVERAGE CLASS: ---	
FINISH: CLEAN, DON'T SAND NO. REQ'D: 2			
FINAL ASSY NO.:			SILK SCREEN: N
DWN	DATE	CHK	DATE
ZJM	9/22/2020		
APP	DATE		
JGW	9-22-20		
TOLERANCES		SCALE: 1/5	
UNLESS NOTED OTHERWISE			
MILL, LATHE, SHEETMETAL = ± 0.005		ANGLES = ± 0.5°	
BENDS ON SHEETMETAL PARTS = ± 0.010			
ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE			
LUDLUM MEASUREMENTS, INC. 301 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 461

ALL DIMENSIONS ARE SUBJECT TO CHANGE
DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 439A, 439B, 439C, 439D

SEE SHEET 511X375C FOR
THE STEEL CONSTRUCTION

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	11/30/07	RHS
2	ECF2264 ADDED HOLES FOR OPTION BOX	12/26/07	RHS
3	ECF2837 CHANGED TO 12' DET SPACING	10/21/20	ZJM

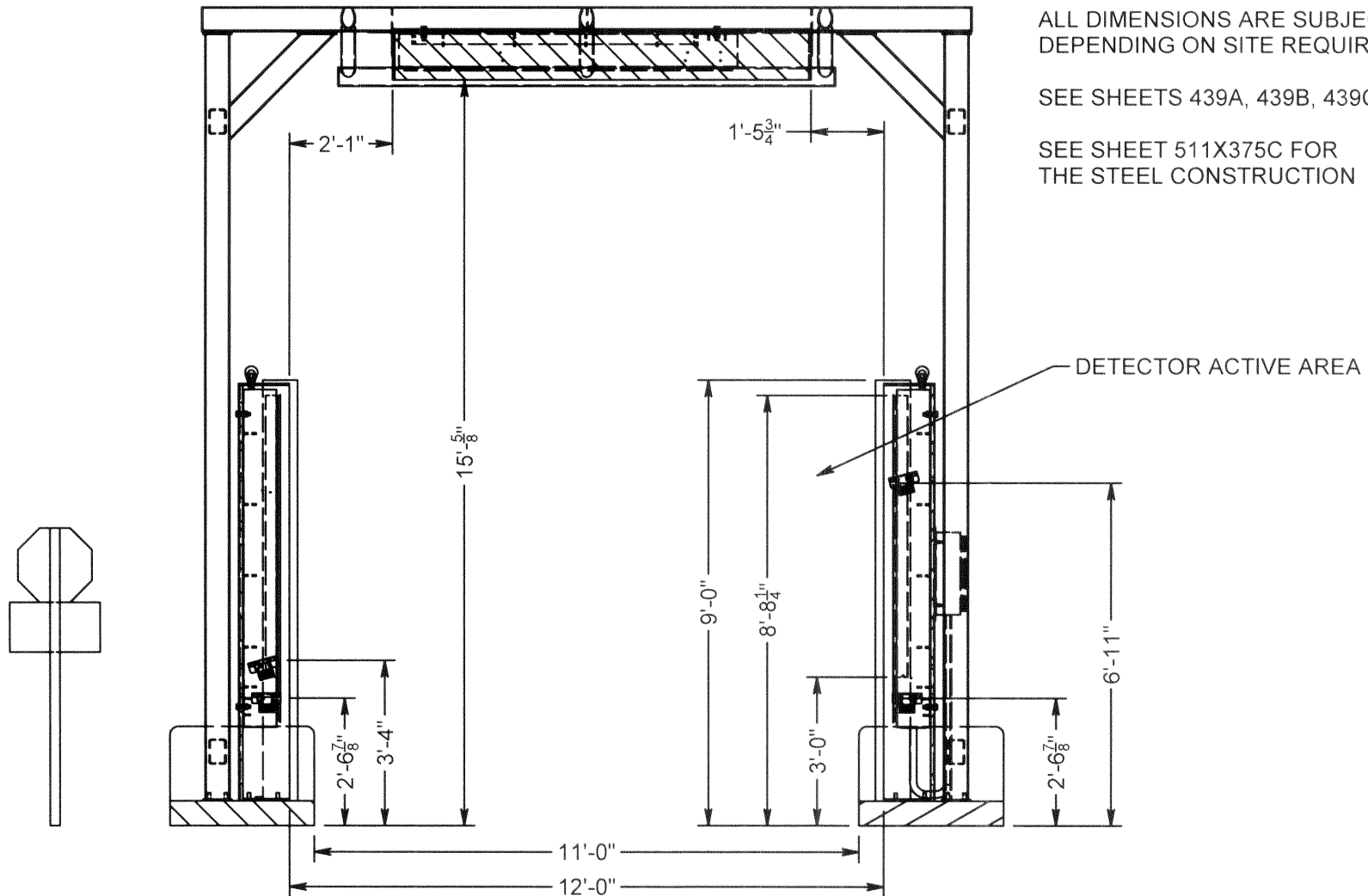


DWN ZJM	DATE 11/19/2020	DESIGN AUTHORITY JGWITT	APP Jew	DATE 11-19-20
DWG NUM: 4511-439			SCALE: --	
TITLE: M 4525-10500 TYPICAL INSTALL				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 439	

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
EVERYTHING SHOULD BE MOVED UP BY
18" AND ONLY TOP IR SENSORS ARE USED.

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	11/30/07	RHS
2	ECF2264 ADDED HOLES FOR OPTION BOX	12/26/07	RHS
3	ECF2837 CHANGED TO 12' DET SPACING	10/21/20	ZJM

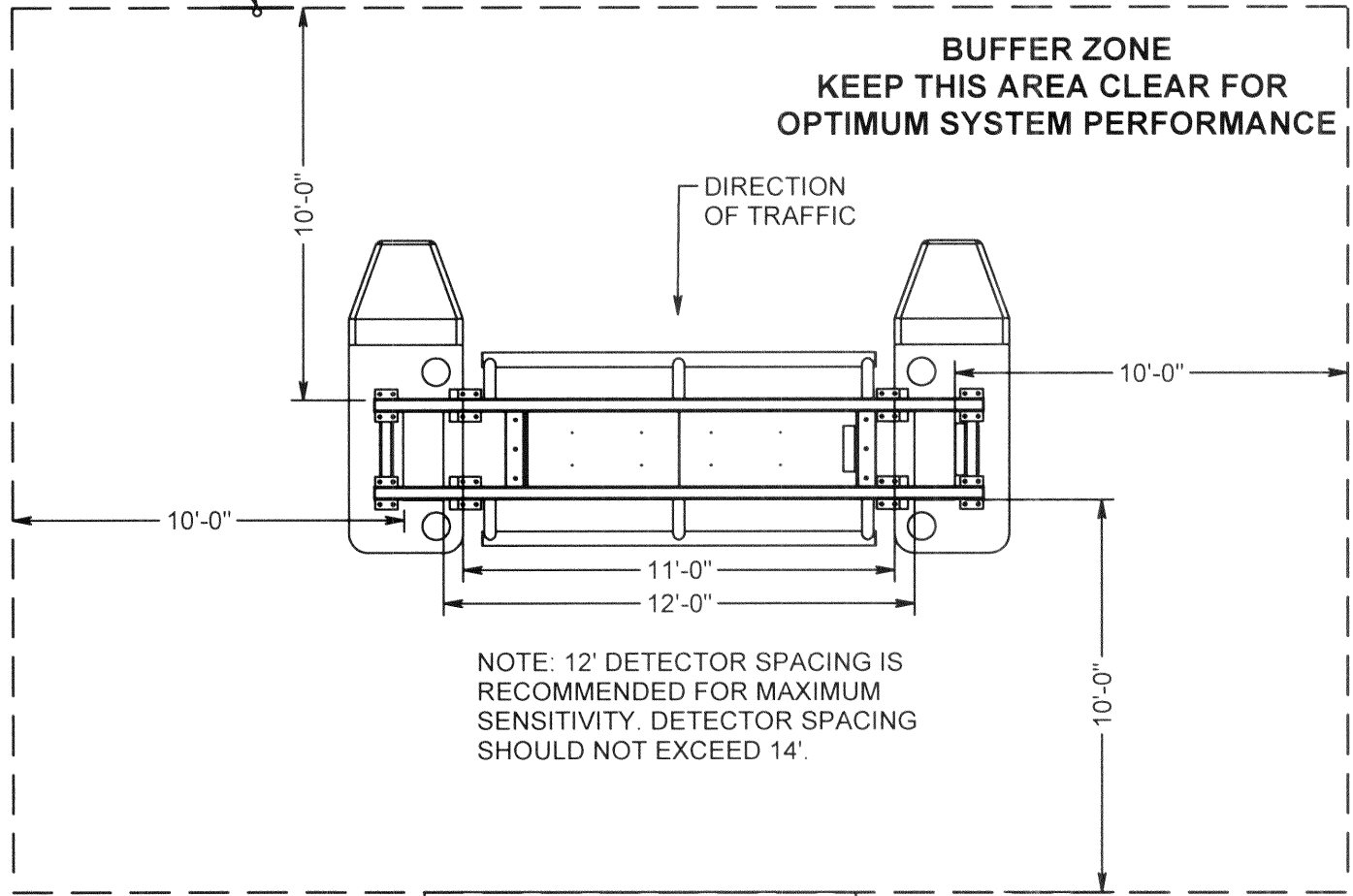
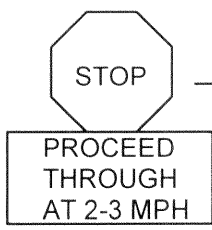


NOTE: 12' SPACING FOR MAX
SENSITIVITY. SPACING SHOULD
NOT EXCEED 14'.
(SEE SHEET 439B)

DWN ZJM	DATE 11/19/2020	DESIGN AUTHORITY JGWITT	APP <i>Jow</i>	DATE 11-20-20
DWG NUM: 4511-439			SCALE: --	
TITLE: M 4525-10500 DET ELEVATION				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 439A

REVISION HISTORY

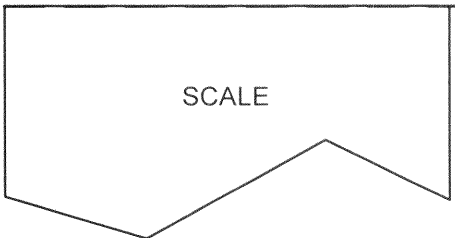
REV	DESCRIPTION	DATE	BY
1	VALID	11/30/07	RHS
2	ECF2264 ADDED HOLES FOR OPTION BOX	12/26/07	RHS
3	ECF2837 CHANGED TO 12' DET SPACING	10/21/20	ZJM



ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 439A, 439B, 439C, 439D

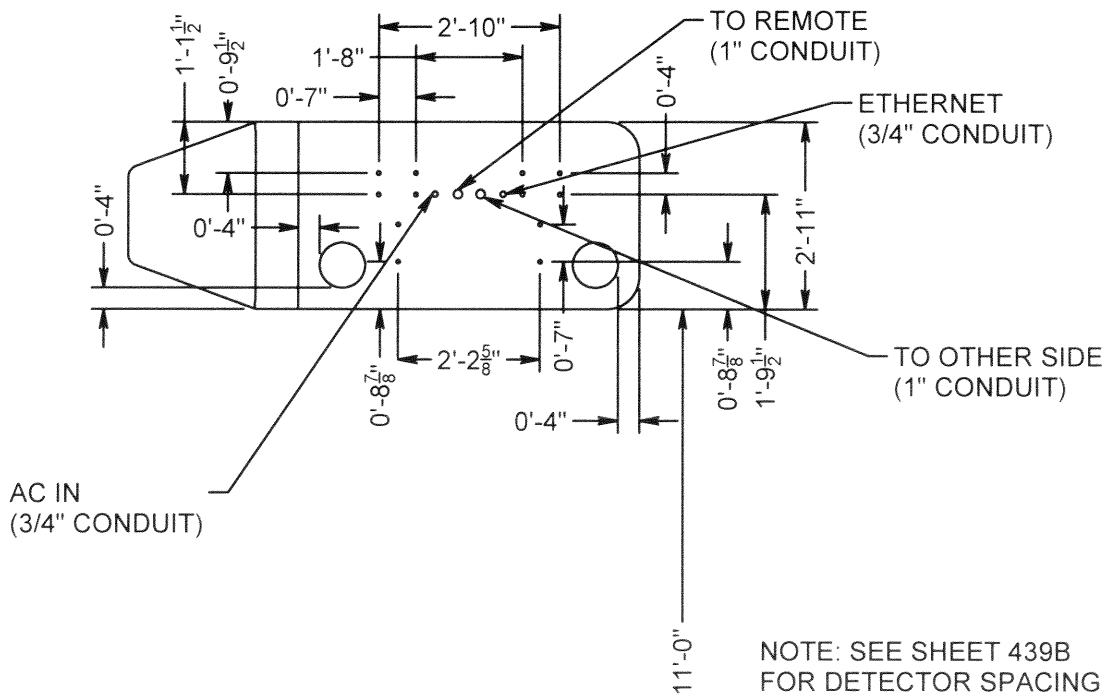
SEE SHEET 511X375C FOR THE STEEL CONSTRUCTION



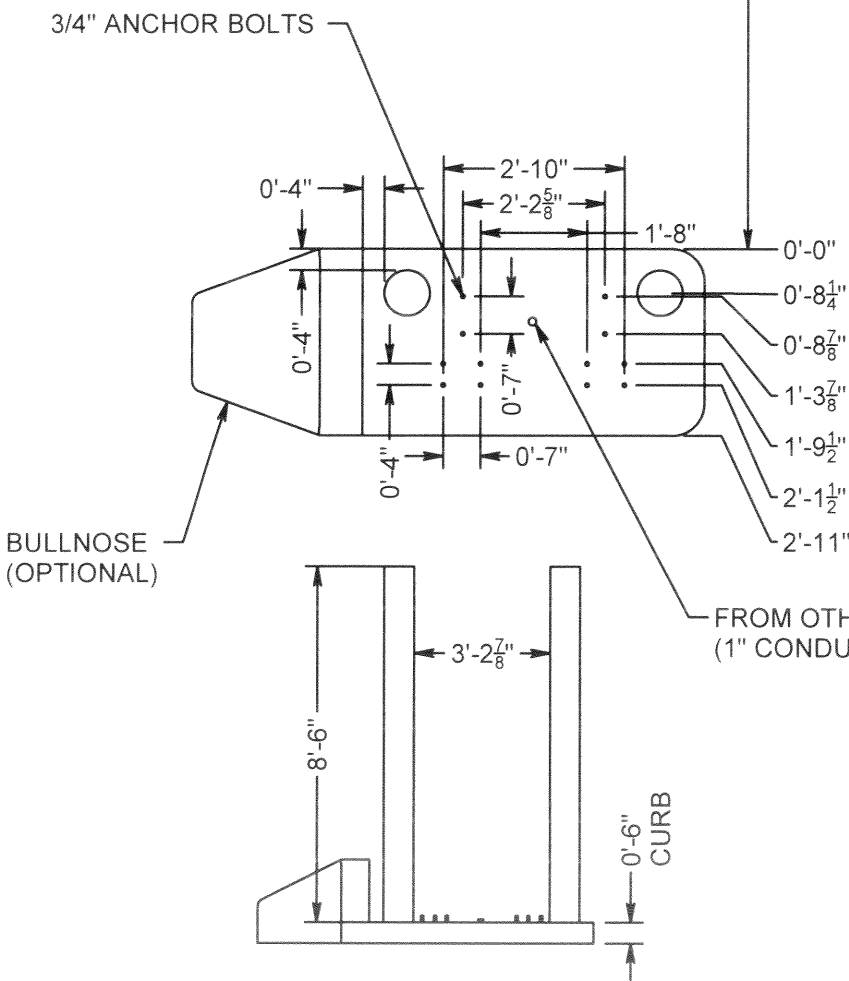
DWN ZJM	DATE 11/19/2020	DESIGN AUTHORITY JGWITT	APP Jow	DATE 11-20-20
DWG NUM: 4511-439			SCALE: --	
TITLE: M 4525-10500 AERIAL VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 439B	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	11/30/07	RHS
2	ECF2264 ADDED HOLES FOR OPTION BOX	12/26/07	RHS
3	ECF2837 CHANGED TO 12' DET SPACING	10/21/20	ZJM



NOTE: SEE SHEET 439B FOR DETECTOR SPACING



SEE SHEET 511X836(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

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE, EVERYTHING SHOULD BE MOVED UP BY 18" AND ONLY TOP IR SENSORS ARE USED

SEE SHEETS 439, 439A, 439B, 439D

SEE SHEET 511X375C FOR THE STEEL CONSTRUCTION

DWN ZJM	DATE 11/19/2020	DESIGN AUTHORITY JGWITT	APP New	DATE 11-19-20
DWG NUM: 4511-439			SCALE: --	
TITLE: M 4525-10500 PLAN VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 439C	

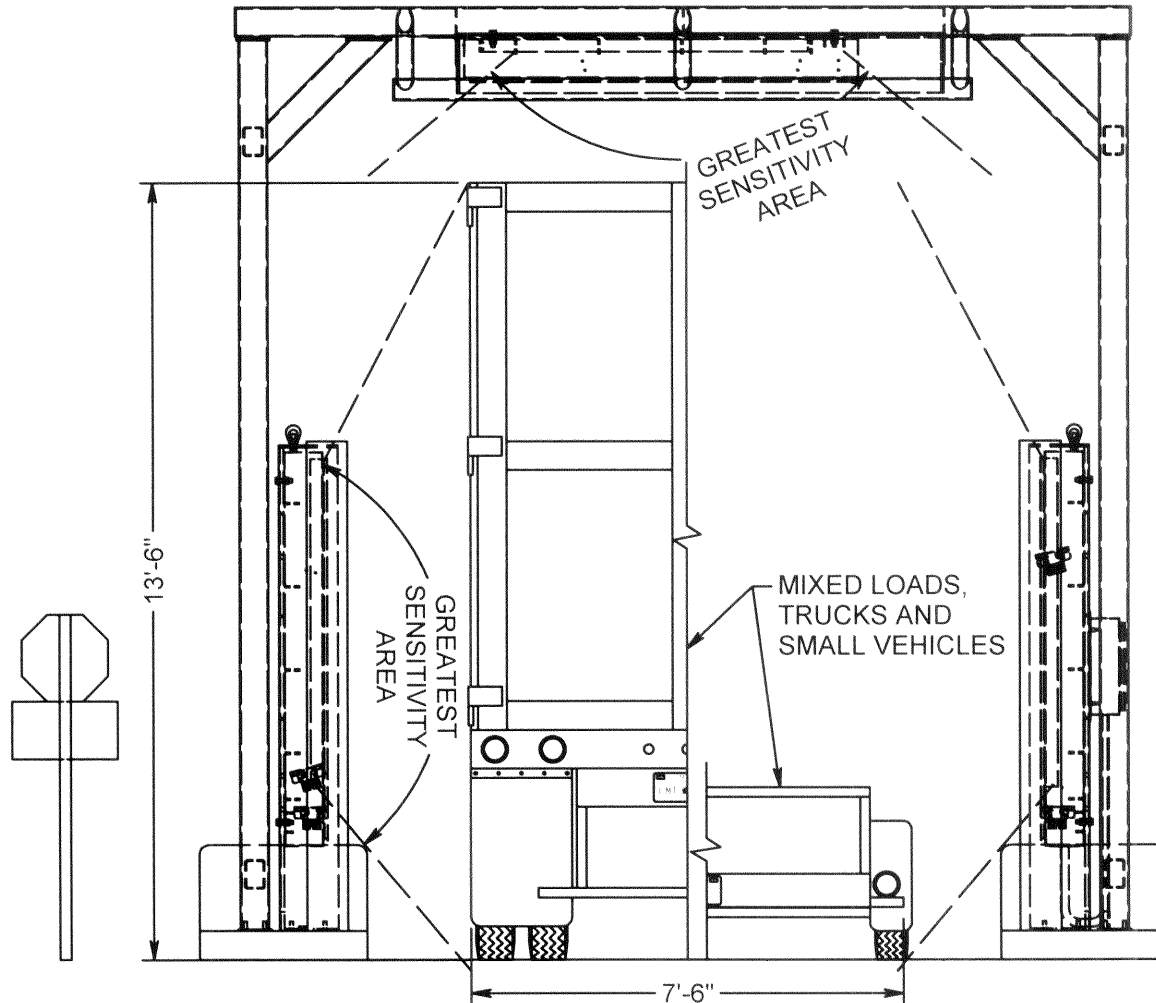
ALL DIMENSIONS ARE SUBJECT TO CHANGE
DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 439A, 439B, 439C, 439D

SEE SHEET 511X375C FOR
THE STEEL CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	11/30/07	RHS
2	ECF2264 ADDED HOLES FOR OPTION BOX	12/26/07	RHS
3	ECF2837 CHANGED TO 12' DET SPACING	10/21/20	ZJM

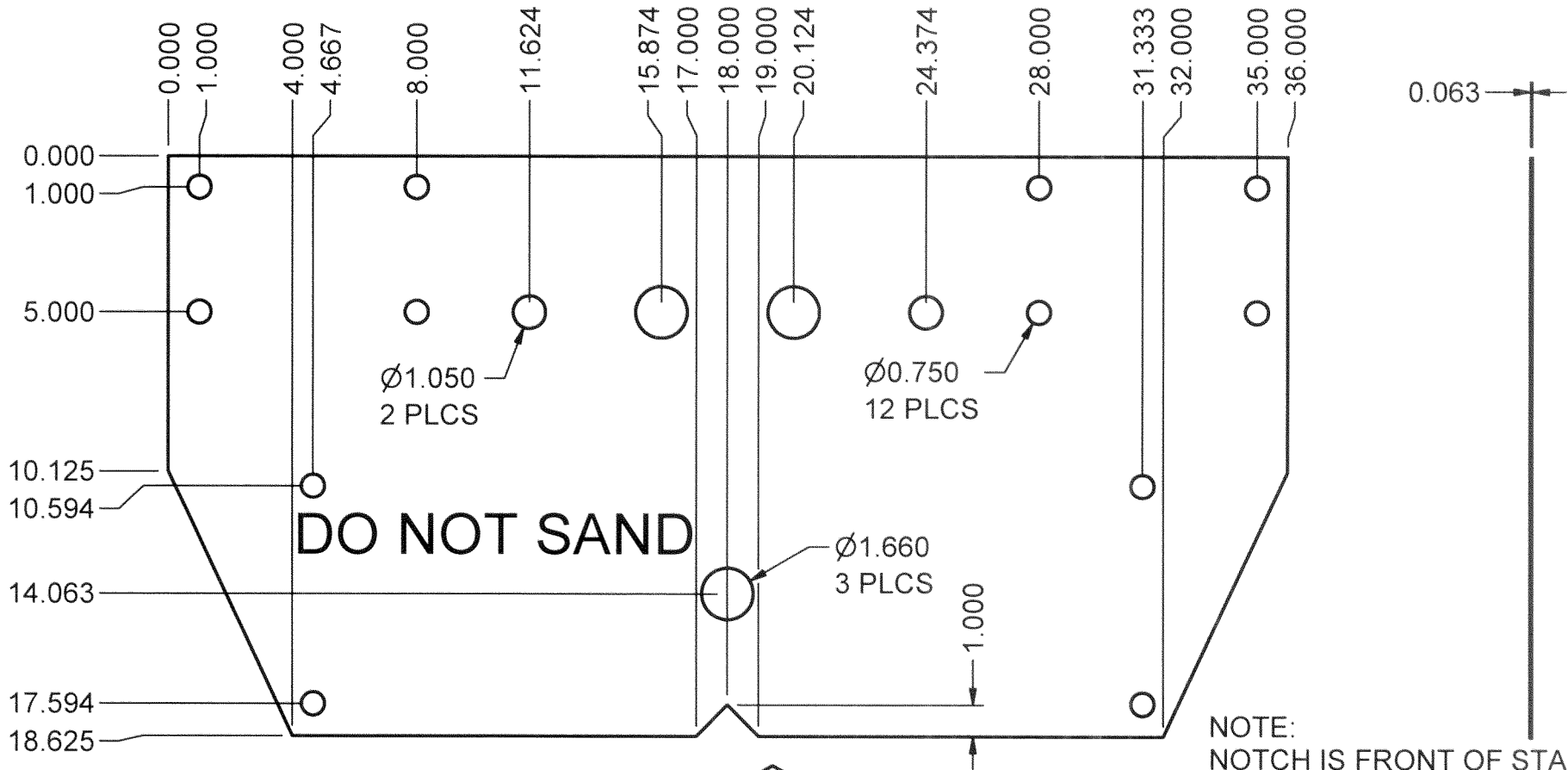


SENSITIVITY NOTE:
AREA SHOWN IS THE GREATEST
SENSITIVITY AREA. THE SYSTEM
WILL DETECT RADIATION OUTSIDE
OF THAT AREA, BUT WITH
REDUCED SENSITIVITY.

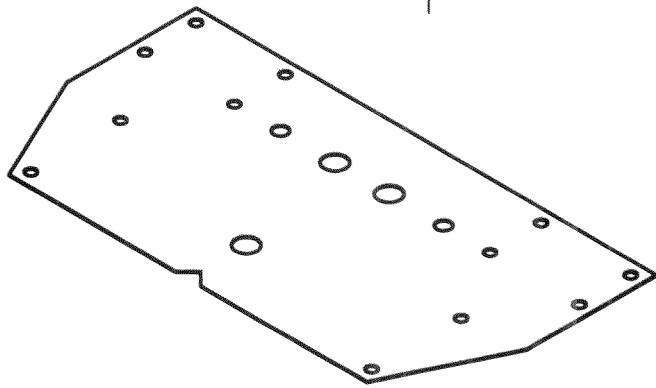
DWN ZJM	DATE 12/2/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 12-2-20
DWG NUM: 4511-439			SCALE: --	
TITLE: M 4525-10500 SENSITIVE AREA				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 439D

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	12/6/07	RHS
2	CHANGED NOTCH	4/11/12	MSC
3	ECF 5688 CHANGED PN#	9/21/20	ZJM



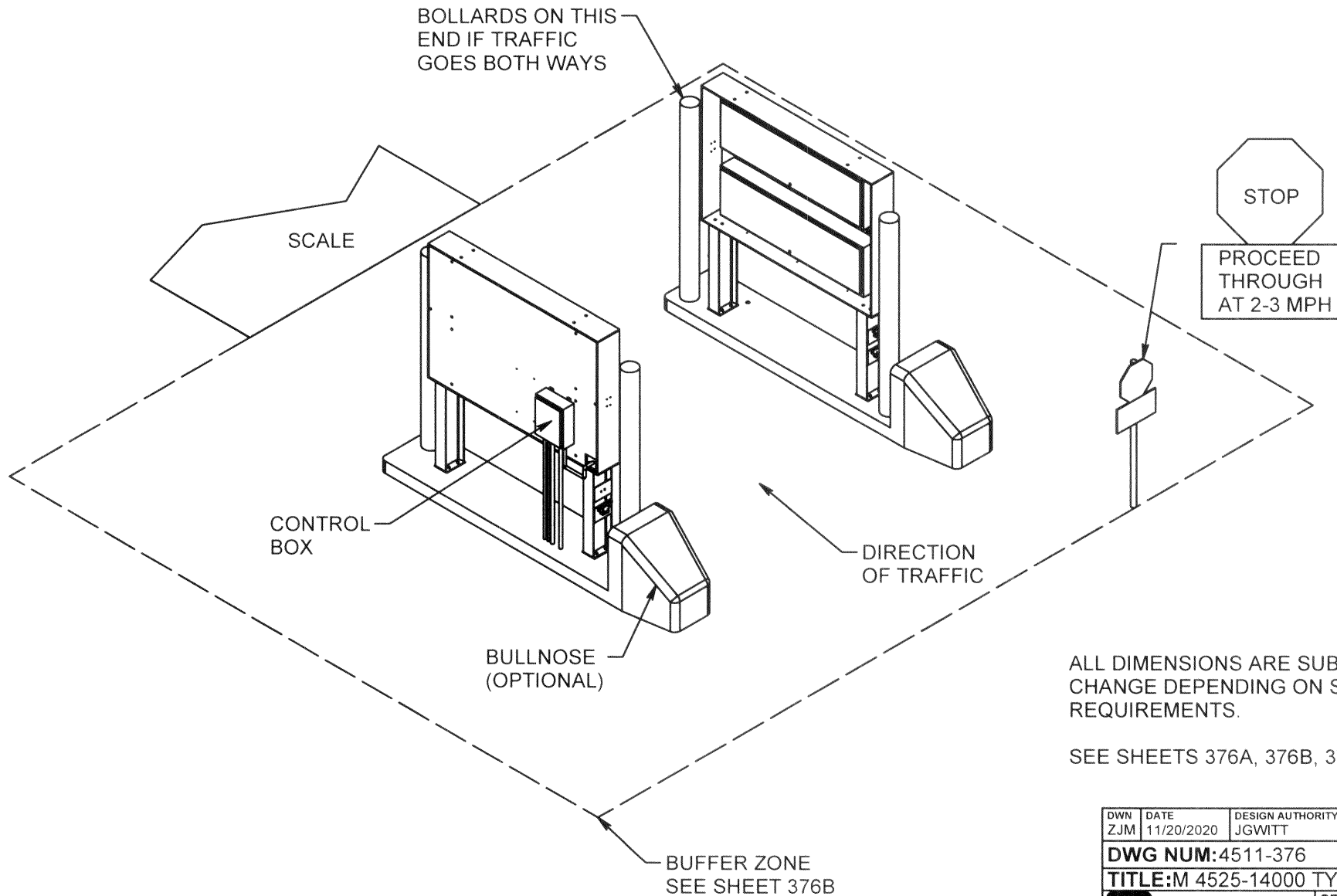
NOTE:
NOTCH IS FRONT OF STAND
FACING TRAFFIC LANE



DESC: ANCHOR BOLT TEMPLATE			
MODEL NO.: 4525-10500		PART NO.: 7511-449-01	
MAT'L.: 16 GA. HOT DIPPED GALVANIZED			
SIZE: 671 SI.			
MAT'L. NO.: 37-9820			
FINISH: CLEAN			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 MILL, LATHE, STRIPPIT= ± 0.005 BENDS ON SHEETMETAL PARTS= ± 0.010			SCALE: 3/16
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SHEET 449
SERIES 511			


REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	6/2/07	JGW
2	ECF2264 ADDED HOLES, MOVED TOP SENSORS	12/26/07	RHS
3	UPDATED SENSOR LOCATION	8/13/19	CMC
4	ECF2837 CHANGED TO 12' DETECTOR SPACING	10/22/20	ZJM



ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

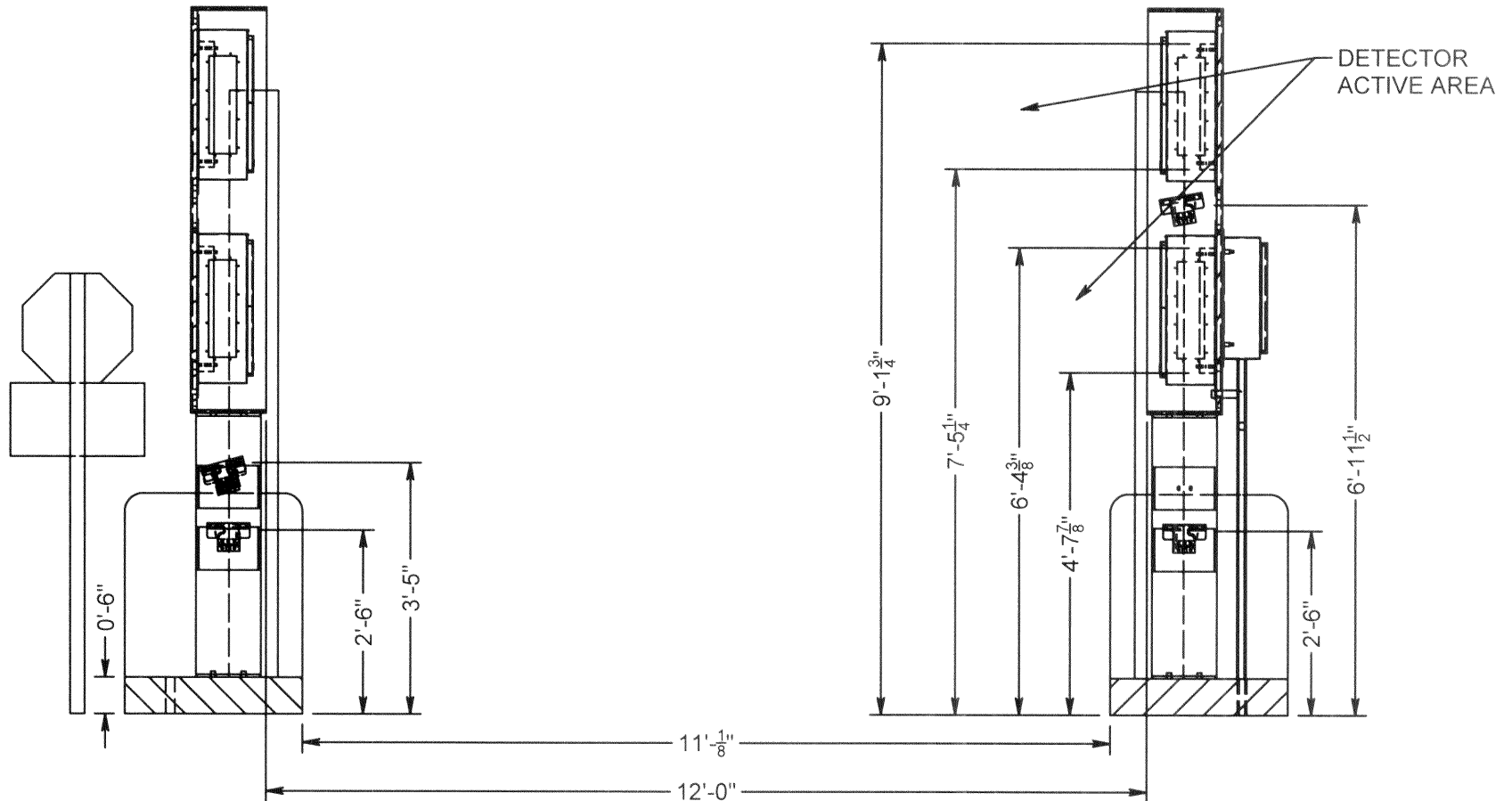
SEE SHEETS 376A, 376B, 376C, 376D, 376E

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-376			SCALE: --	
TITLE: M 4525-14000 TYPICAL INSTALL				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 376	

NOTE: FOR EXCLUSIVE TRUCK OR RAIL
EVERYTHING SHOULD BE MOVED UP BY 18"
AND ONLY TOP IR SENSORS USED.

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	6/2/07	JGW
2	ECF2264 ADDED HOLES, MOVED TOP SENSORS	12/26/07	RHS
3	UPDATED SENSOR LOCATION	8/13/19	CMC
4	ECF2837 CHANGED TO 12' DETECTOR SPACING	10/22/20	ZJM

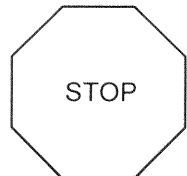


ALL DIMENSIONS ARE SUBJECT TO
CHANGE DEPENDING ON SITE
REQUIREMENTS.

NOTE: 12' SPACING FOR MAX
SENSITIVITY. SPACING SHOULD
NOT EXCEED 14'.
(SEE SHEET 376B)

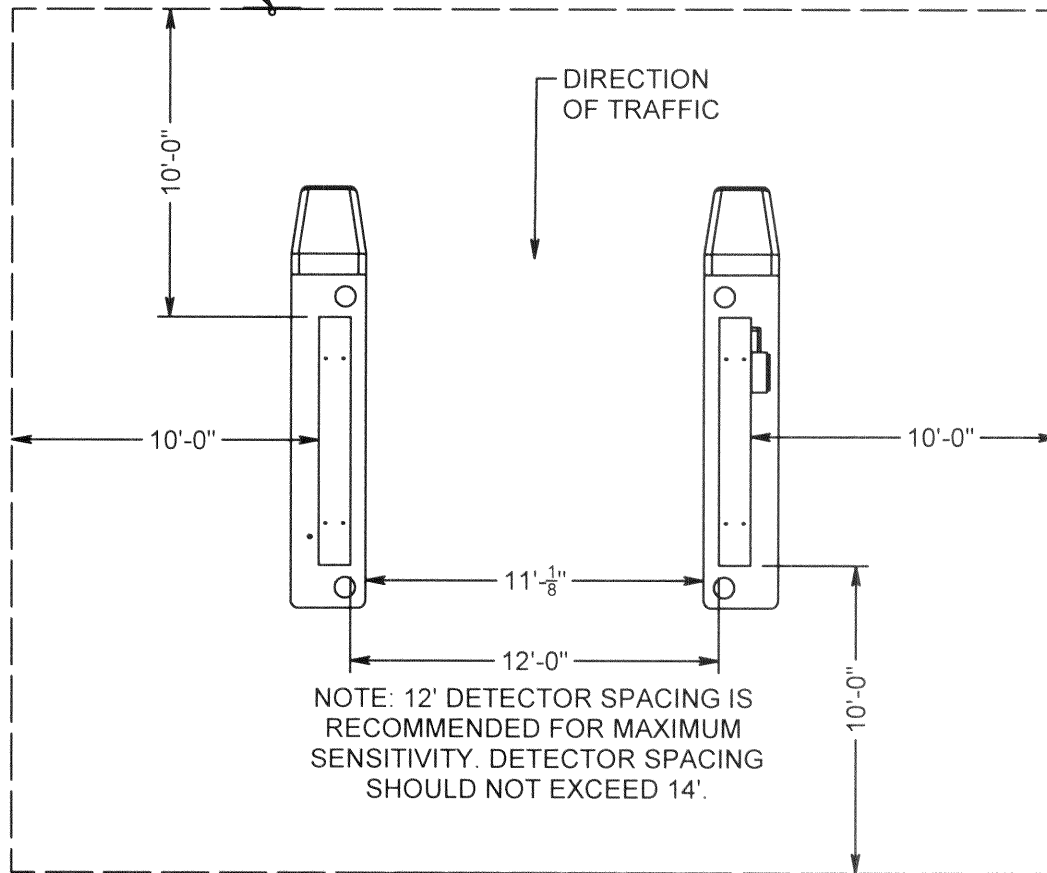
SEE SHEETS 376, 376B, 376C, 376D, 376E

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-376			SCALE: --	
TITLE: M 4525-14000 DET. ELEVATION				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 376A	



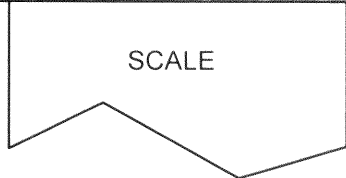
PROCEED THROUGH AT 2-3 MPH

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	6/2/07	JGW
2	ECF2264 ADDED HOLES, MOVED TOP SENSORS	12/26/07	RHS
3	UPDATED SENSOR LOCATION	8/13/19	CMC
4	ECF2837 CHANGED TO 12' DETECTOR SPACING	10/22/20	ZJM



**BUFFER ZONE
KEEP THIS AREA CLEAR FOR
OPTIMUM SYSTEM PERFORMANCE**

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.

SEE SHEETS 376, 376A, 376C, 376D

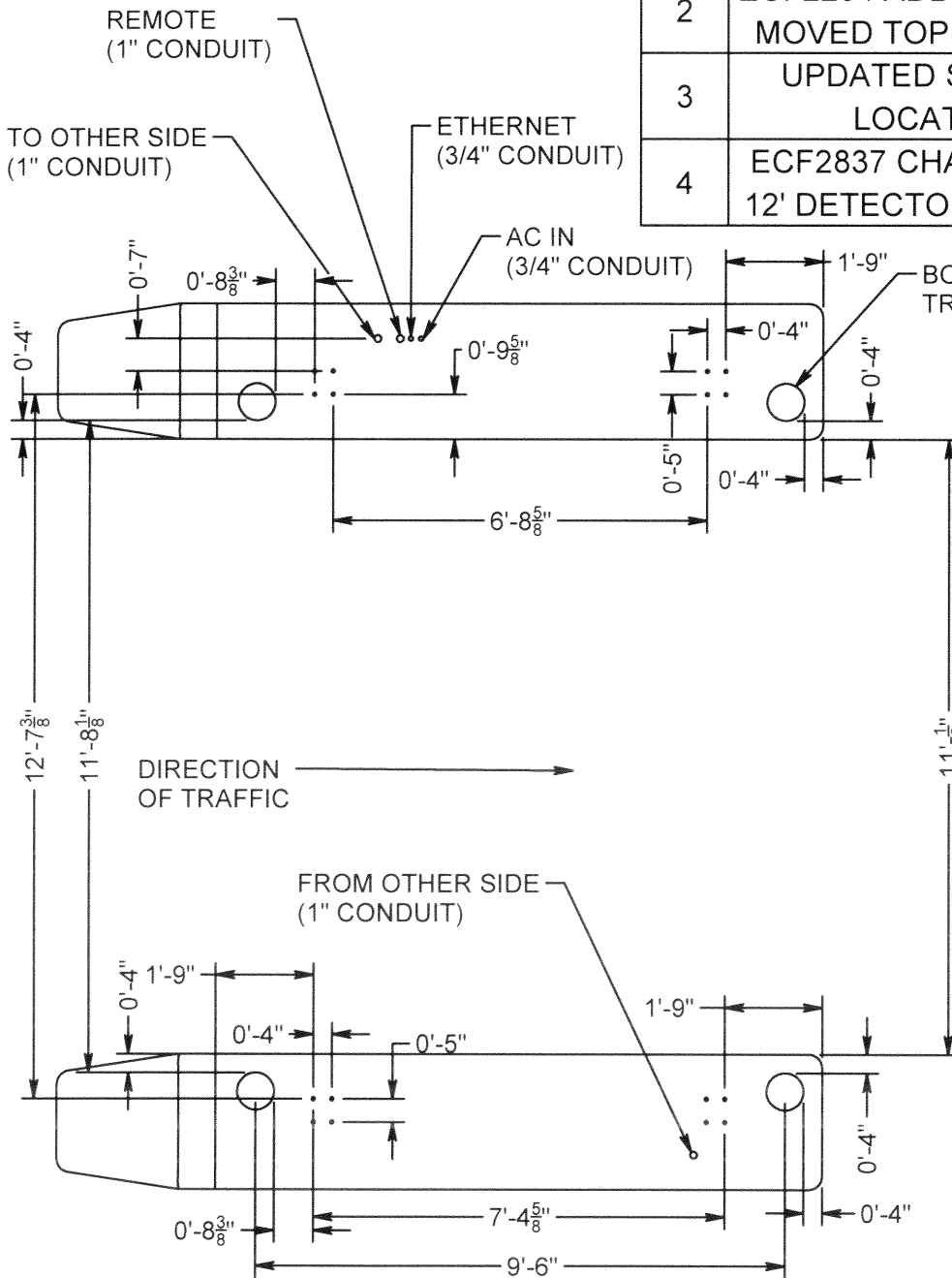
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 376, 376A, 376C, 376D, 376E

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-376			SCALE: --	
TITLE: M 4525-14000 AERIAL VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 376B	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	6/2/07	JGW
2	ECF2264 ADDED HOLES, MOVED TOP SENSORS	12/26/07	RHS
3	UPDATED SENSOR LOCATION	8/13/19	CMC
4	ECF2837 CHANGED TO 12' DETECTOR SPACING	10/22/20	ZJM



NOTE: SEE SHEET 376B FOR DETECTOR SPACING

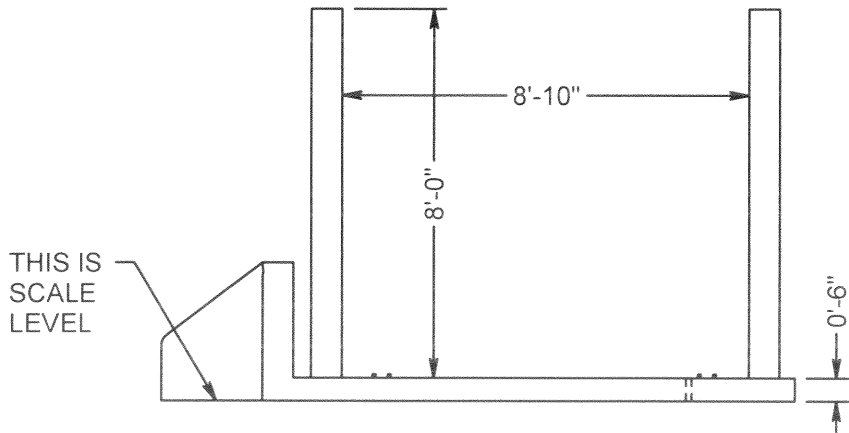
SEE SHEET 511X836(A) FOR CONCRETE AND ANCHOR BOLT DETAILS.

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

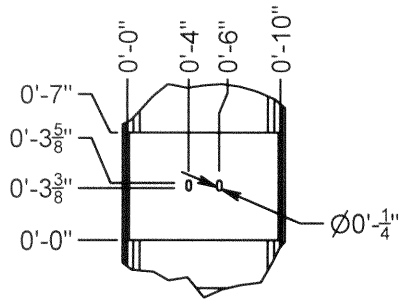
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE, EVERYTHING SHOULD BE MOVED UP BY 18" AND ONLY TOP IR SENSORS USED.

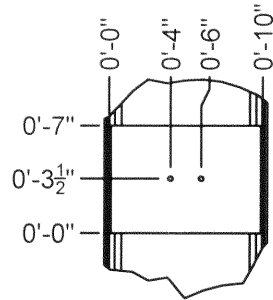
SEE SHEETS 376, 376A, 376B, 376D, 376E



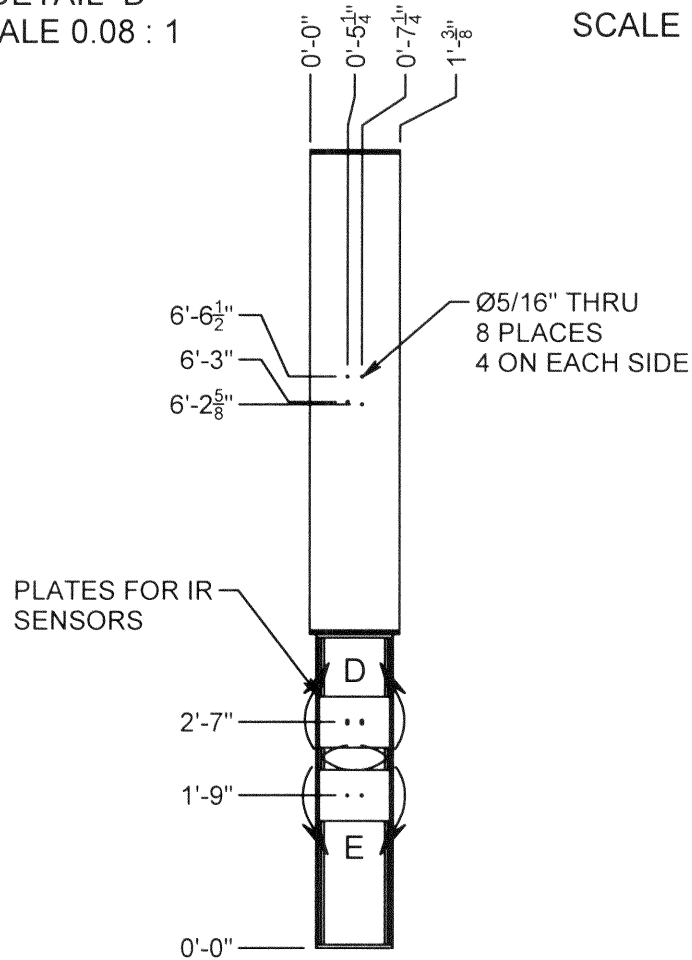
DWN ZJM	DATE 10/23/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-376			SCALE: --	
TITLE: M 4525-14000 PLAN VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 376C	



DETAIL D
SCALE 0.08 : 1

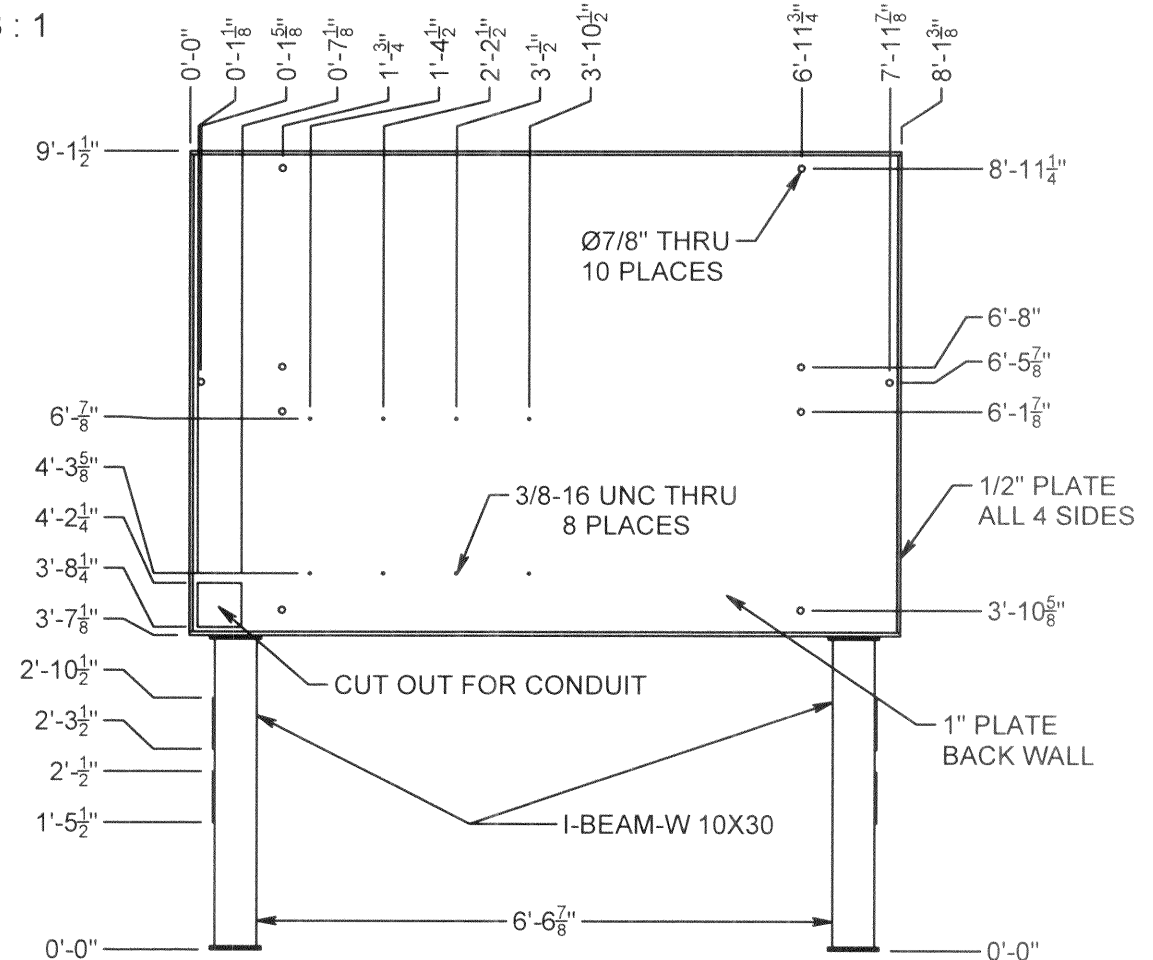


DETAIL E
SCALE 0.08 : 1



WELD PLATES ON BOTH LEGS

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	6/2/07	JGW
2	ECF2264 ADDED HOLES, MOVED TOP SENSORS	12/26/07	RHS
3	UPDATED SENSOR LOCATION	8/13/19	CMC
4	ECF2837 CHANGED TO 12' DETECTOR SPACING	10/22/20	ZJM



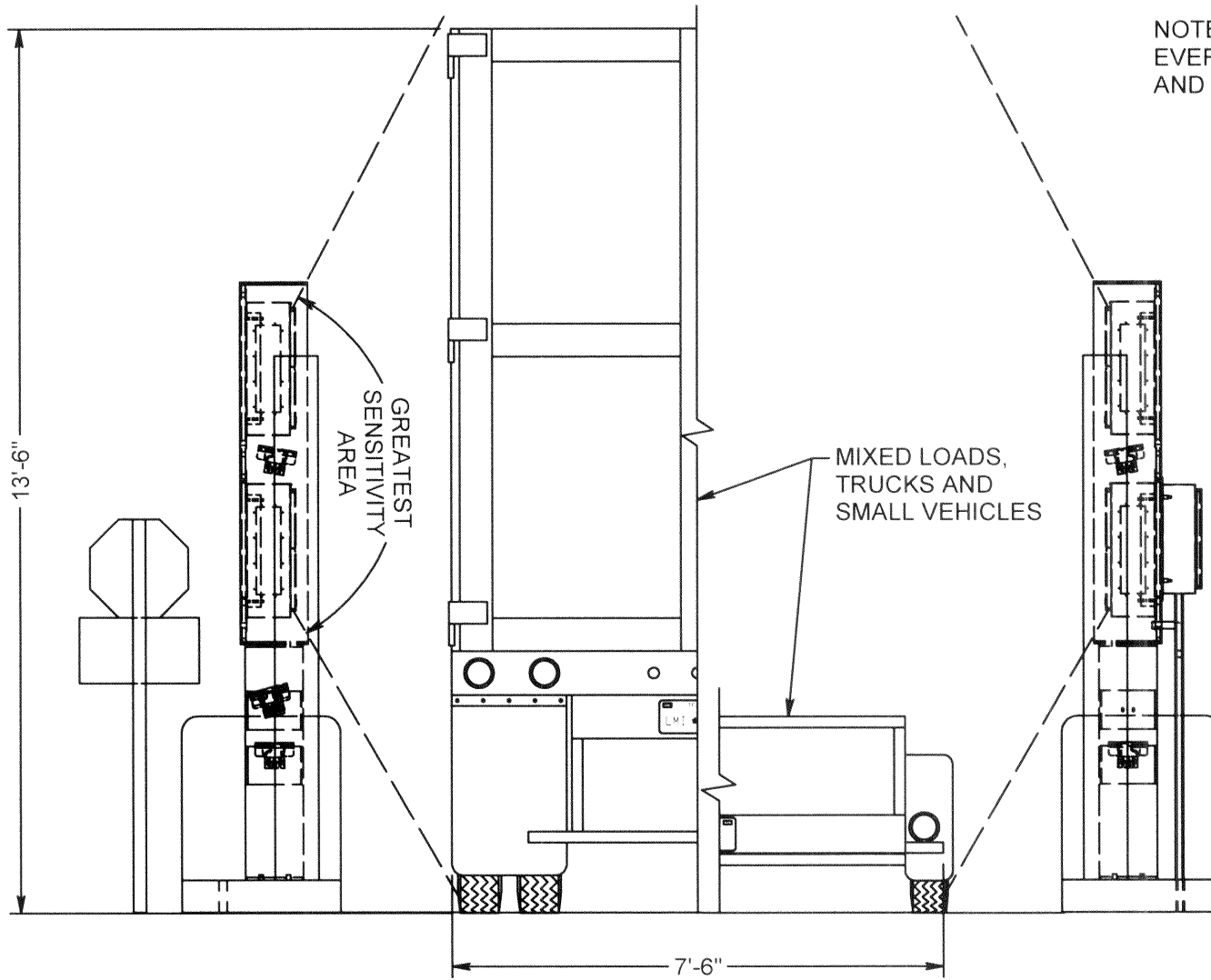
DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-376			SCALE: --	
TITLE: M 4525-14000 STEEL CONSTRUCT				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 376D

ALL DIMENSIONS ARE SUBJECT TO
DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 376, 376A, 376B, 376D


REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	6/2/07	JGW
2	ECF2264 ADDED HOLES, MOVED TOP SENSORS	12/26/07	RHS
3	UPDATED SENSOR LOCATION	8/13/19	CMC
4	ECF2837 CHANGED TO 12' DETECTOR SPACING	10/22/20	ZJM



NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
EVERYTHING SHOULD BE MOVED UP BY 18"
AND ONLY TOP IR SENSORS ARE USED.

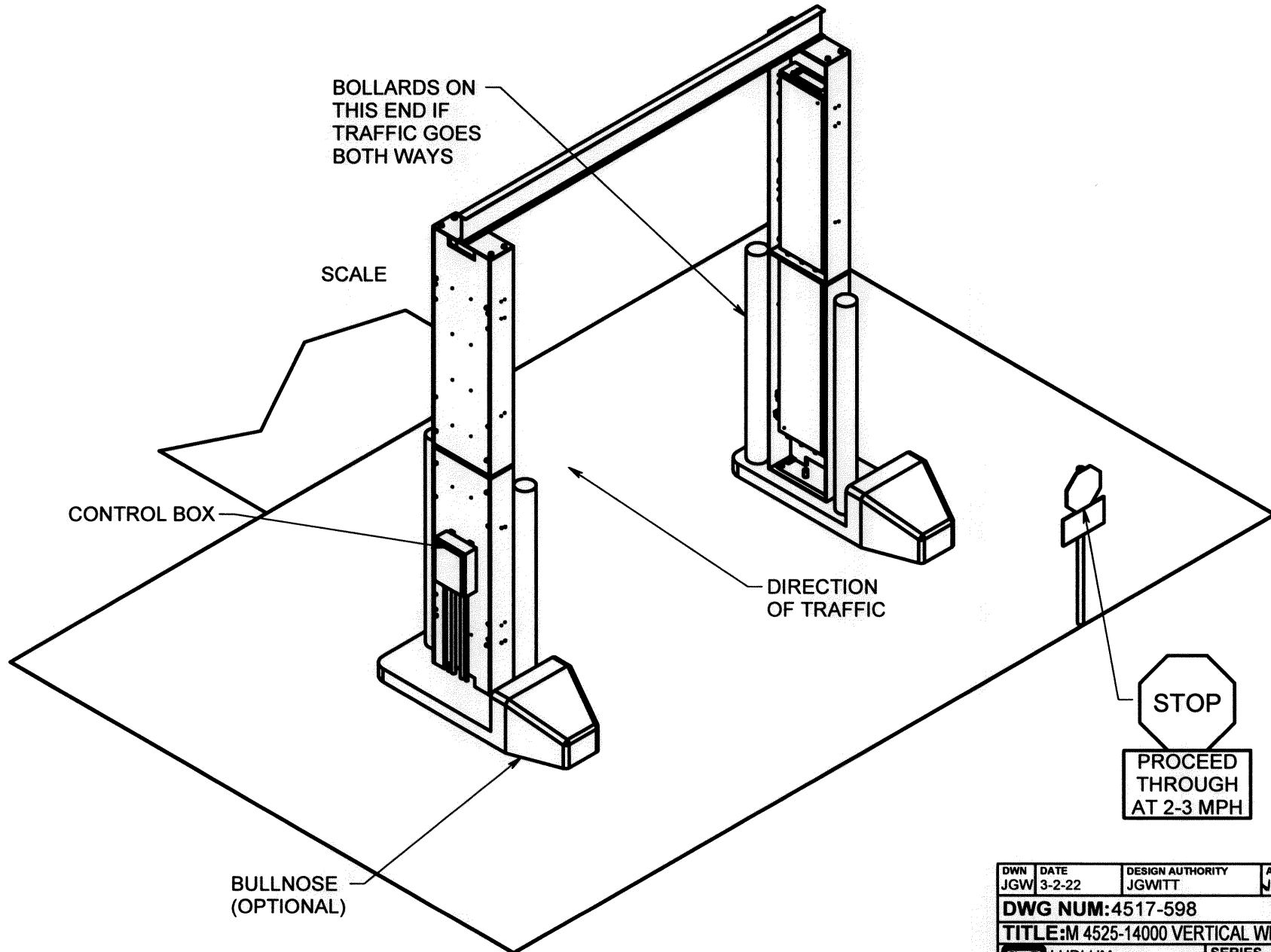
SENSITIVITY NOTE:
AREA SHOWN IS THE GREATEST
SENSITIVITY AREA. THE SYSTEM
WILL DETECT RADIATION OUTSIDE
OF THAT AREA, BUT WITH
REDUCED SENSITIVITY.


DWN ZJM	DATE 12/2/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 12-2-20
DWG NUM: 4511-376			SCALE: ---	
TITLE: M 4525-14000 SENSITIVE AREA				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 376E	

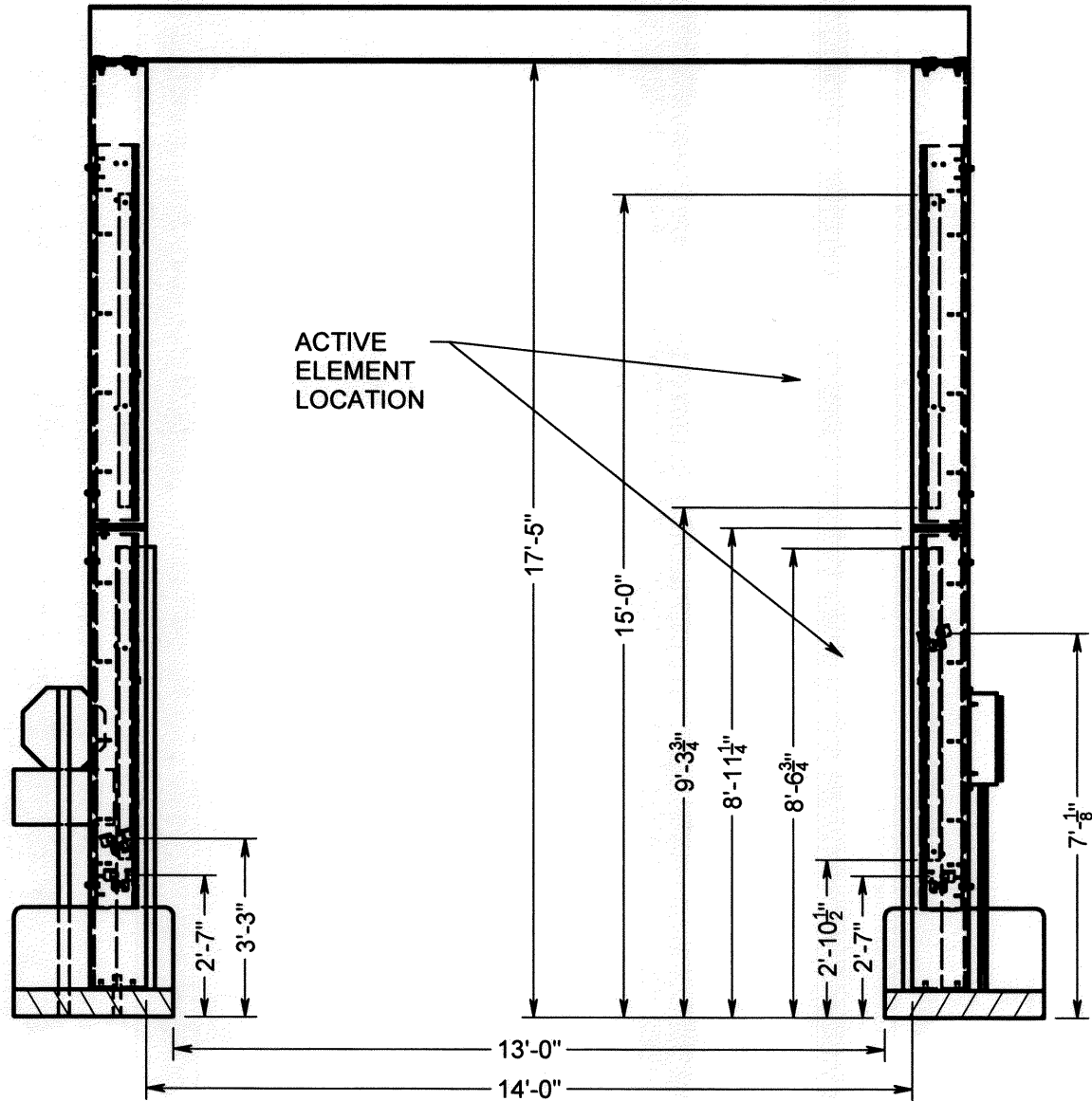
ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS


REVISION HISTORY

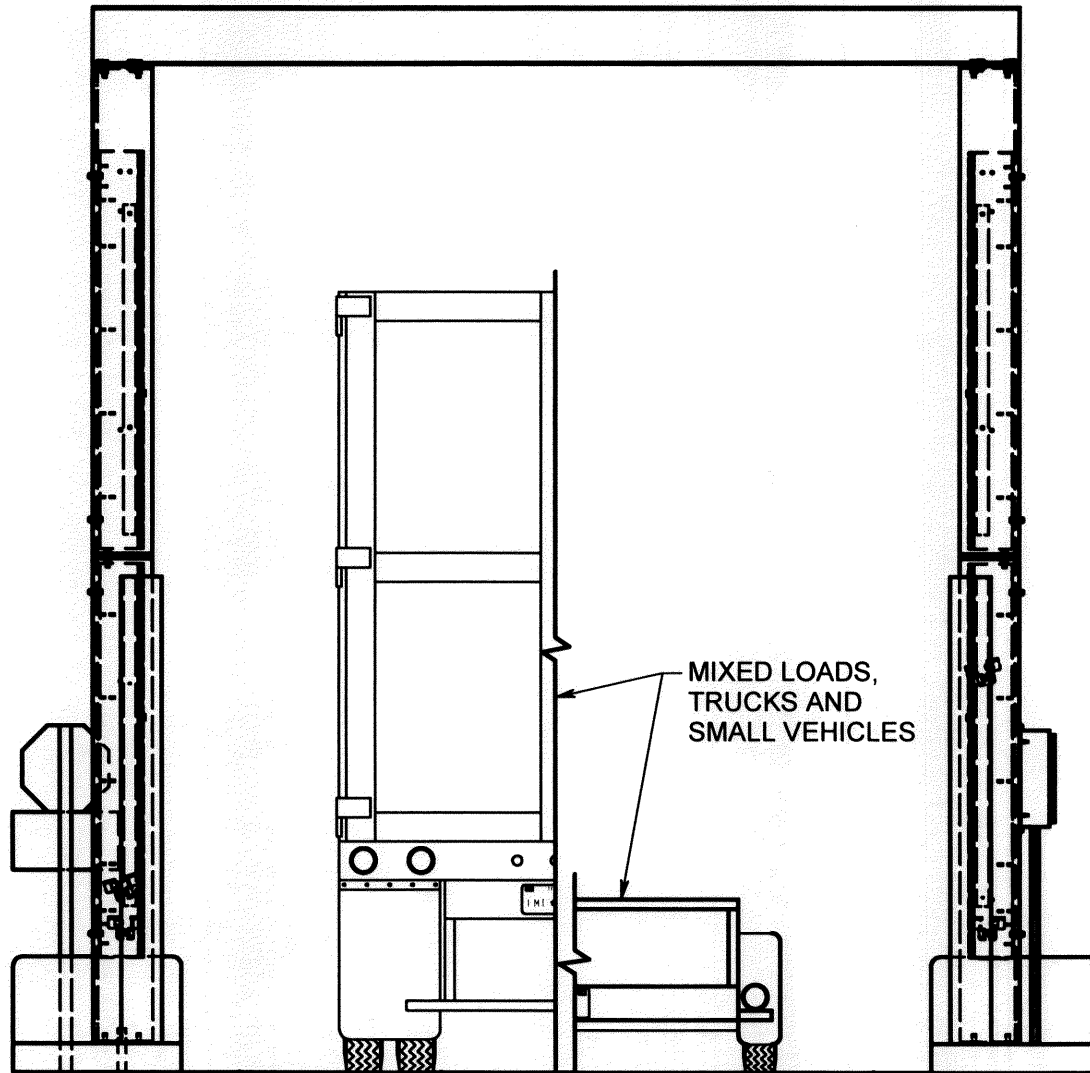
REV	DESCRIPTION	DATE	BY
1	VALID	3-2-22	JGW




DWN JGW	DATE 3-2-22	DESIGN AUTHORITY JGWITT	APP JGW	DATE 3-2-22
DWG NUM: 4517-598			SCALE: --	
TITLE: M 4525-14000 VERTICAL WITH BRACE 14'				
 LUDLUM MEASUREMENTS, INC. 901 OAK STREET SWEETWATER, TEXAS 79556		SERIES 517	SHEET 598	



DWN JGW	DATE 3-2-22	DESIGN AUTHORITY JGWITT	APP JG	DATE 3-2-22
DWG NUM: 4517-598			SCALE: --	
TITLE: M 4525-1400 VERT DET ELEVATION 14'				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 517	SHEET 598A	

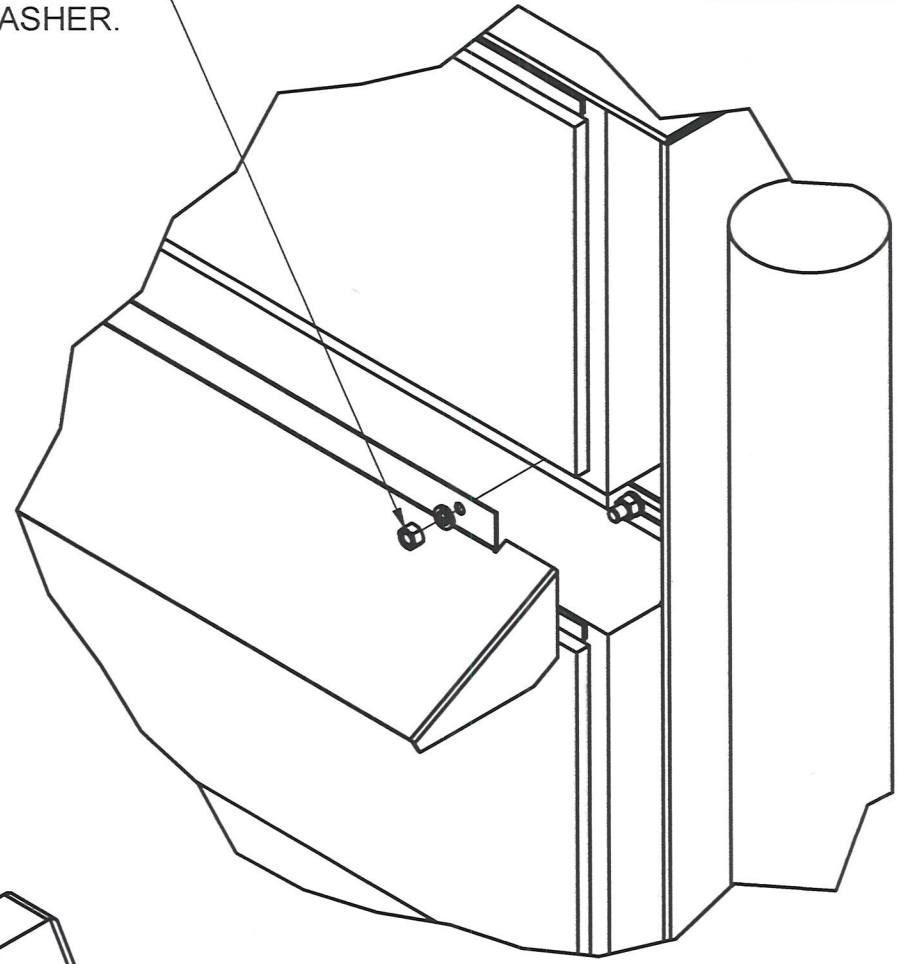
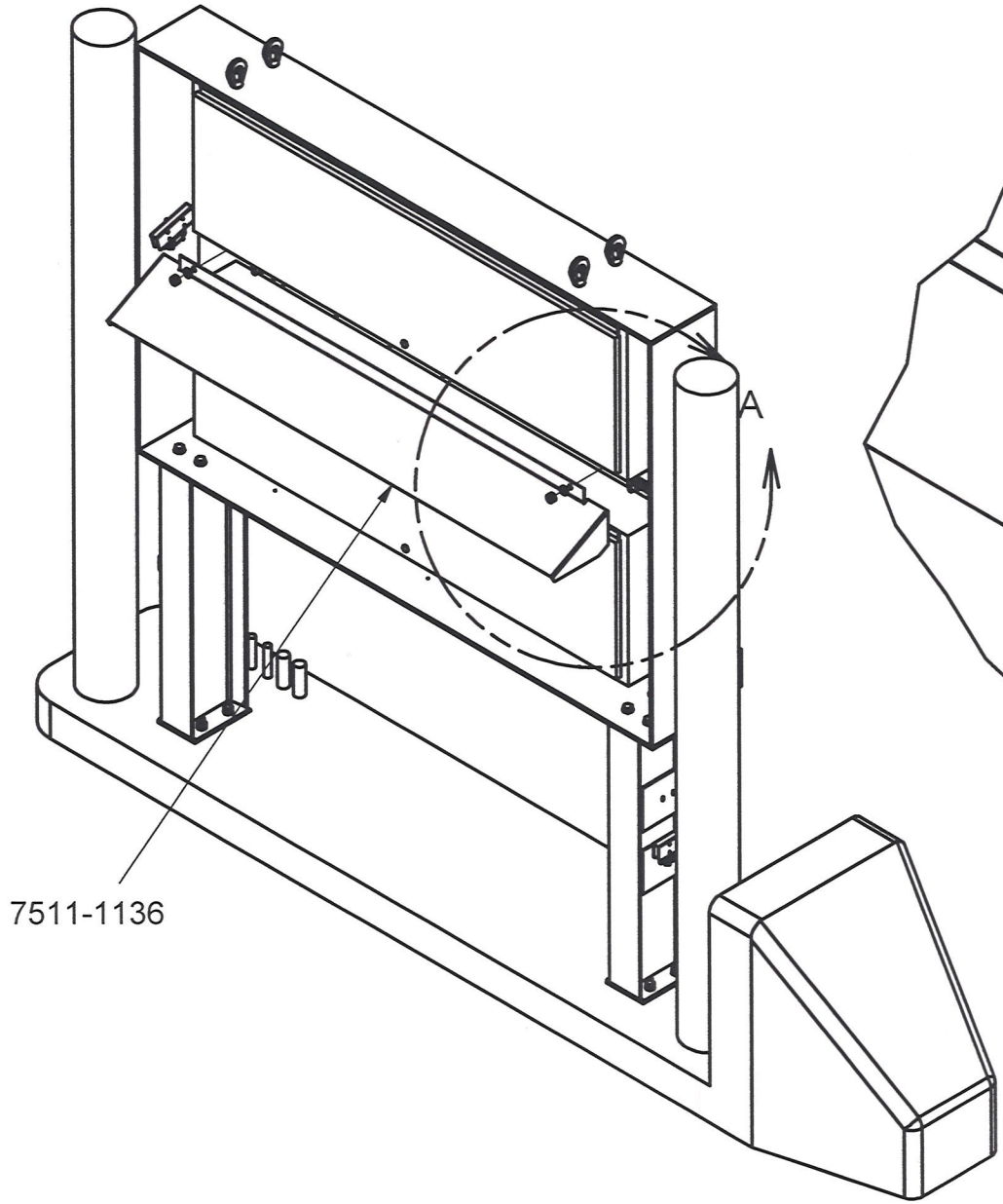


MIXED LOADS,
TRUCKS AND
SMALL VEHICLES

DWN	DATE	DESIGN AUTHORITY	APP	DATE
JGW	3-2-22	JGWITT	JGW	3-2-22
DWG NUM:4517-598			SCALE: --	
TITLE:M 4525-14000 VERT WITH BRACE 14'				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 517	SHEET 598B	

REMOVE EXISTING NUT AND WASHER FROM THE LOWER BOLTS ON THE UPPER DETECTOR, INSTALL RAIN SHIELD, THEN RE-INSTALL NUT AND WASHER.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	1-23-17	JGW



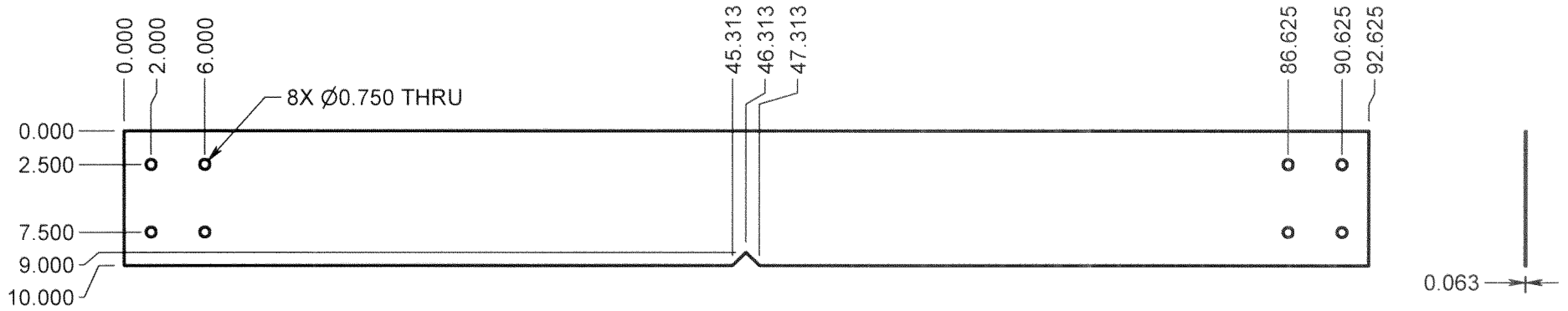
DETAIL A
SCALE 0.1:1

7511-1136

DWN	DATE	CHK	DATE	APP	DATE
JGW	1-23-17			JGW	1-23-17
DWG NUM: 4384-849				SCALE: 1/2	
TITLE M 4525-14000 RAIN SHIELD					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES	SHEET		
		384	849D		

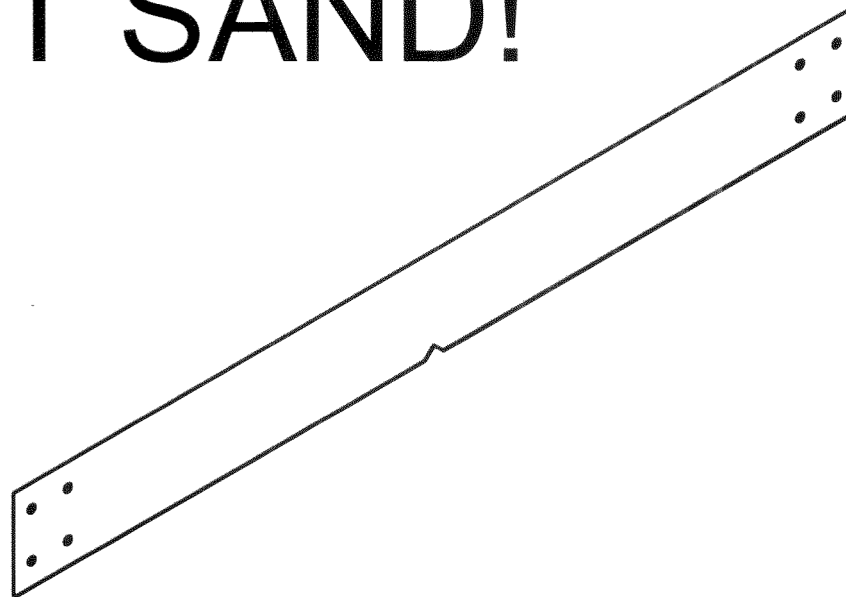
REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	2-7-05	CMC
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.: 4525-14K		PART NO.: 7384-882-01	
MAT'L.: 16 GA HOT DIPPED GALVANIZED			
MAT'L. NO.: 37-9820		SIZE: 927 SI	
SAND CLASS: --	PAINT CLASS: --	COVERAGE CLASS: --	SILK SCREEN: N
FINISH: CLEAN, DON'T SAND			NO. REQ'D: 1
FINAL ASSY NO.: --			
DWN ZJM	DATE 9/21/2020	DESIGN AUTHORITY JGWITT	APP JGW DATE 9-21-20
TOLERANCES: MILL, LATHE, SHEETMETAL = ± 0.005 BENDS ON SHEETMETAL PARTS = ± 0.010 ANGLES = ± 1.0° ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE			SCALE: 1/12
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 384	SHEET 882

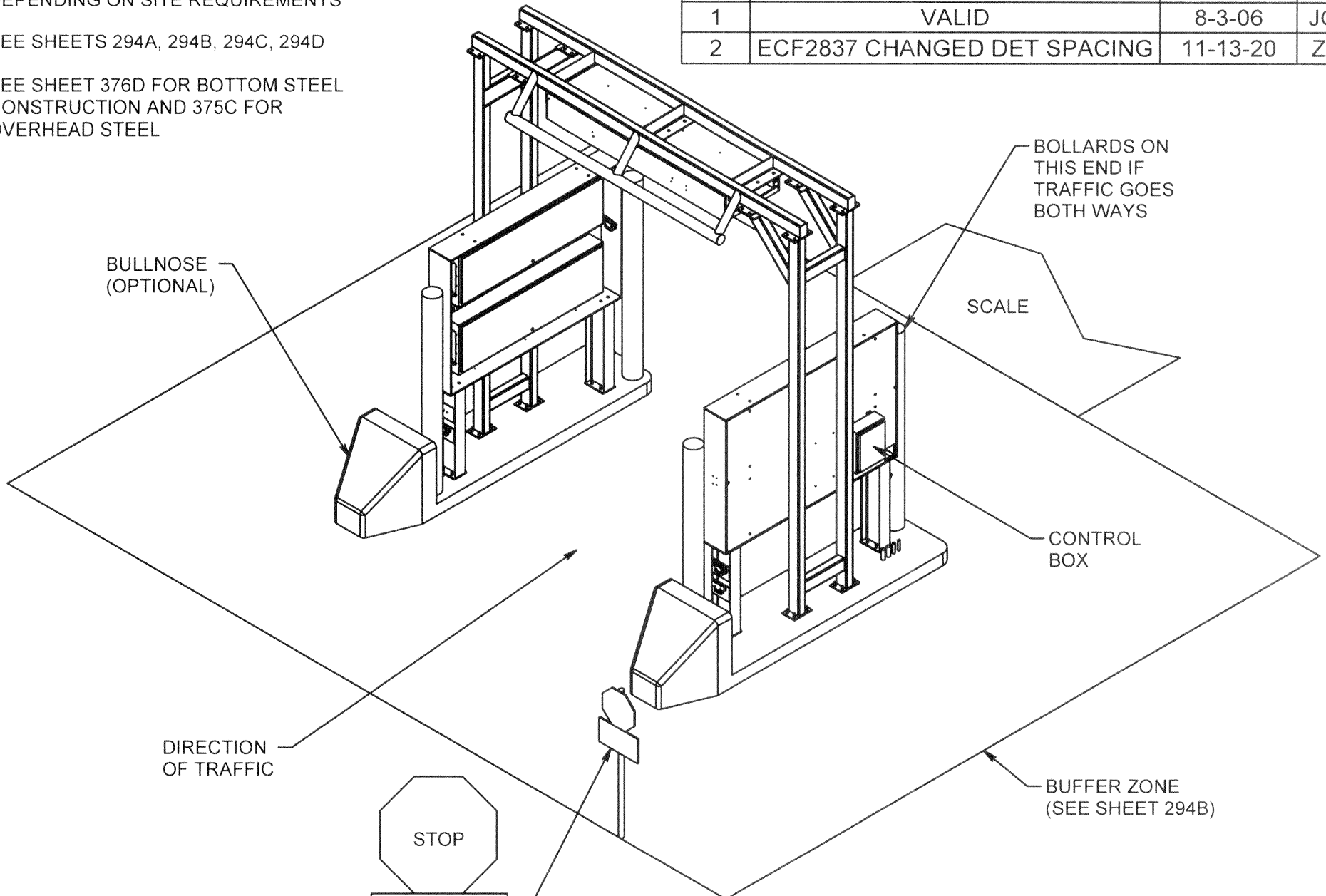
ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS

SEE SHEETS 294A, 294B, 294C, 294D

SEE SHEET 376D FOR BOTTOM STEEL
 CONSTRUCTION AND 375C FOR
 OVERHEAD STEEL

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	8-3-06	JGW
2	ECF2837 CHANGED DET SPACING	11-13-20	ZJM



BULLNOSE
 (OPTIONAL)

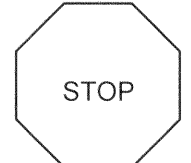
BOLLARDS ON
 THIS END IF
 TRAFFIC GOES
 BOTH WAYS

SCALE

CONTROL
 BOX

BUFFER ZONE
 (SEE SHEET 294B)

DIRECTION
 OF TRAFFIC



PROCEED
 THROUGH
 AT 2-3 MPH

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-294			SCALE: --	
TITLE: M 4525-17500 TYPICAL INSTALL			SERIES 511	SHEET 294
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556				

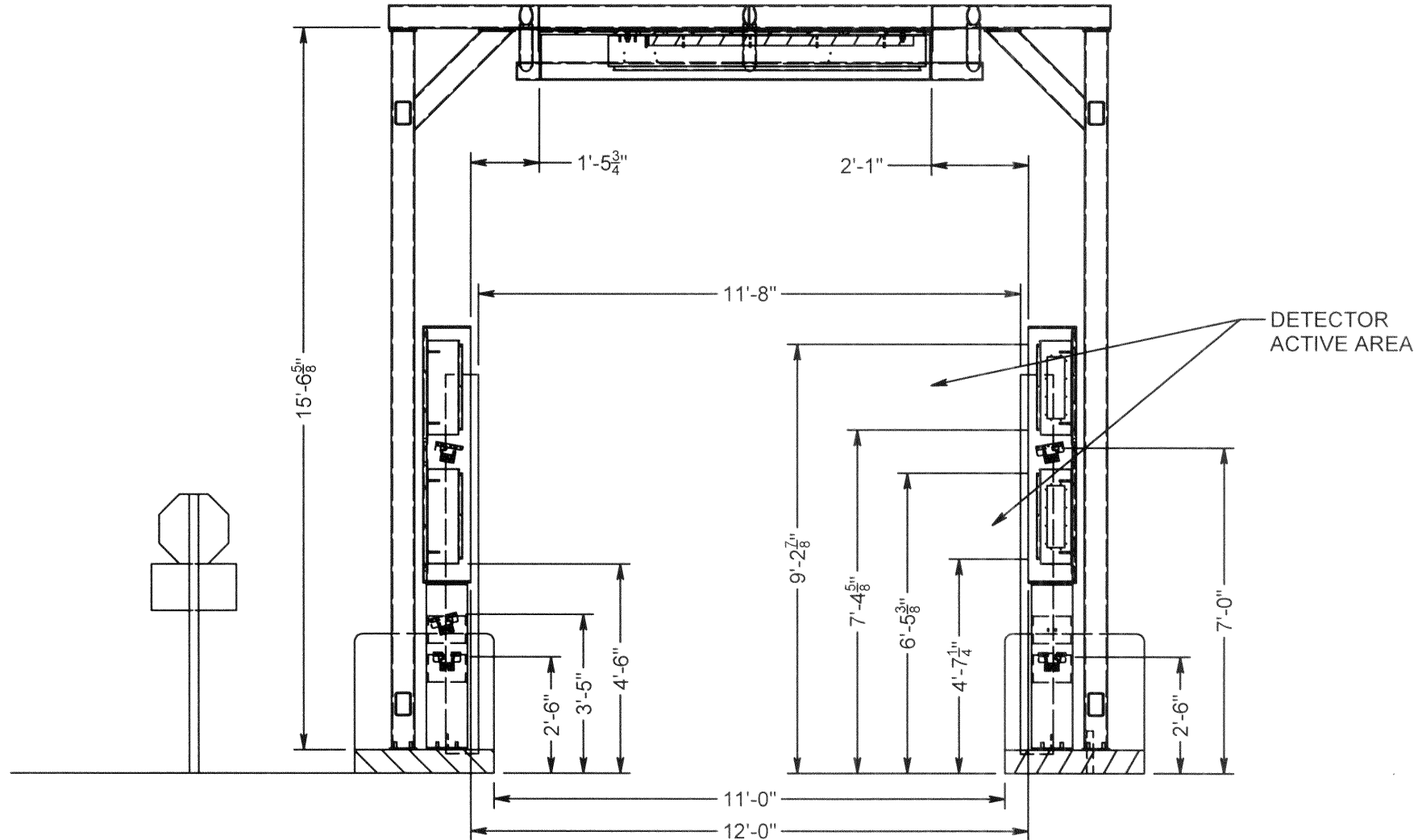
ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS

SEE SHEETS 294, 294B, 294C, 294D

SEE SHEET 376D FOR BOTTOM STEEL
 CONSTRUCTION AND 375C FOR
 OVERHEAD STEEL

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	8-3-06	JGW
2	ECF2837 CHANGED DET SPACING	11-13-20	ZJM

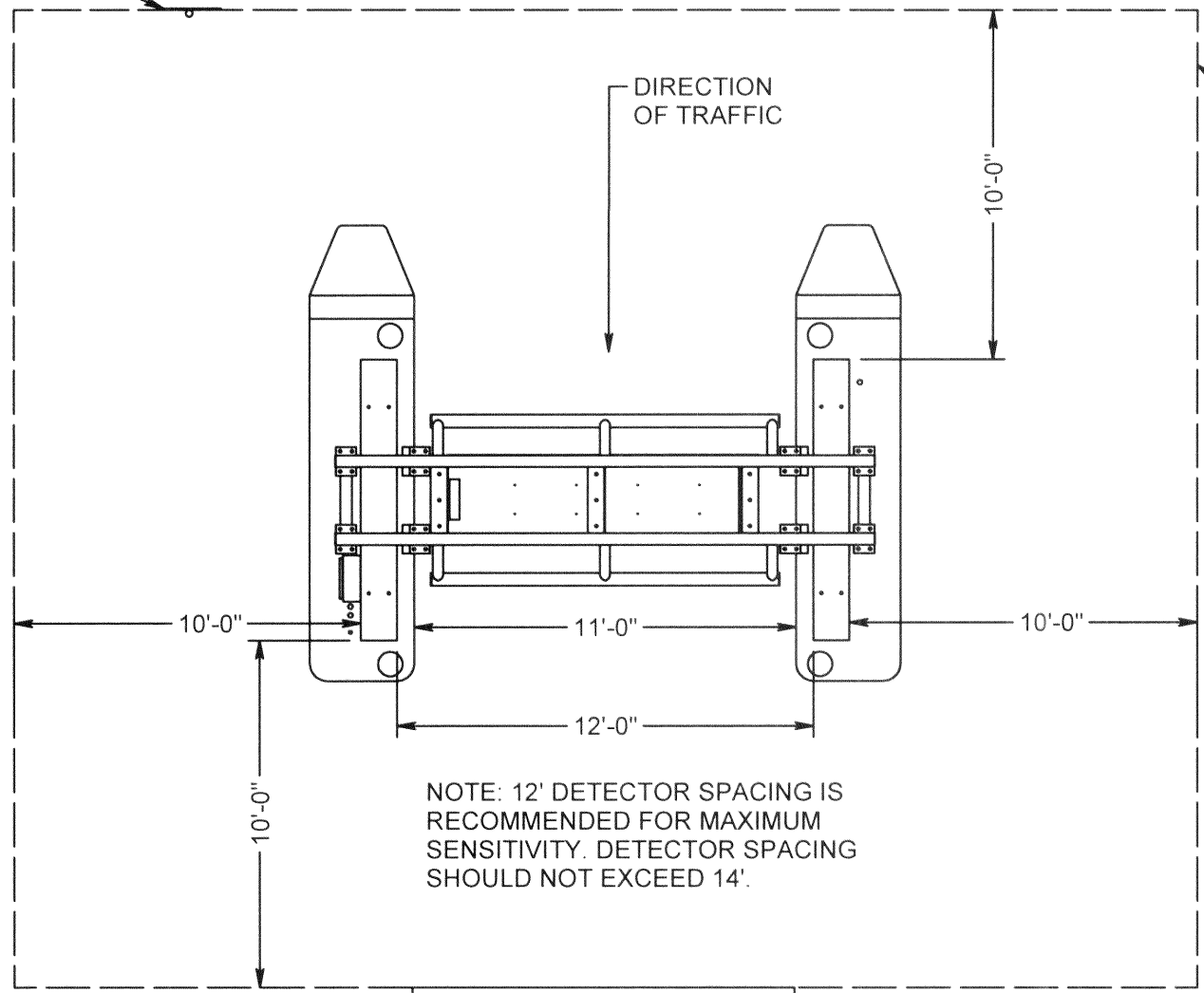
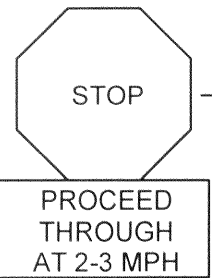


NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
 EVERYTHING SHOULD BE MOVED UP BY 18"
 AND ONLY TOP IR SENSORS SHOULD BE USED.

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-294			SCALE: --	
TITLE: M 4525-17500 DET ELEVATION				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 294A

REVISION HISTORY

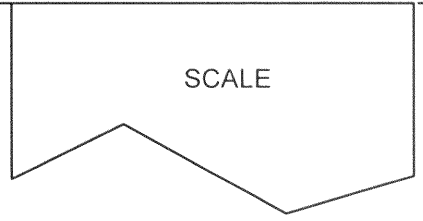
REV	DESCRIPTION	DATE	BY
1	VALID	8-3-06	JGW
2	ECF2837 CHANGED DET SPACING	11-13-20	ZJM



BUFFER ZONE
KEEP THIS AREA CLEAR FOR OPTIMUM SYSTEM PERFORMANCE

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



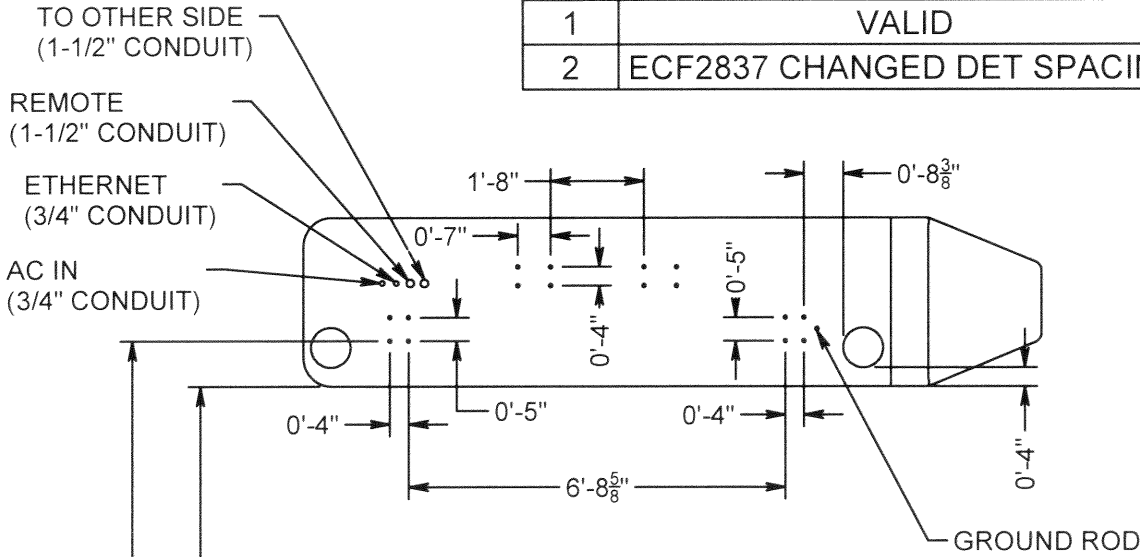
SEE SHEETS 294, 294A, 294C, 294D

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-294			SCALE: --	
TITLE: M 4525-17500 AERIAL VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 294B	

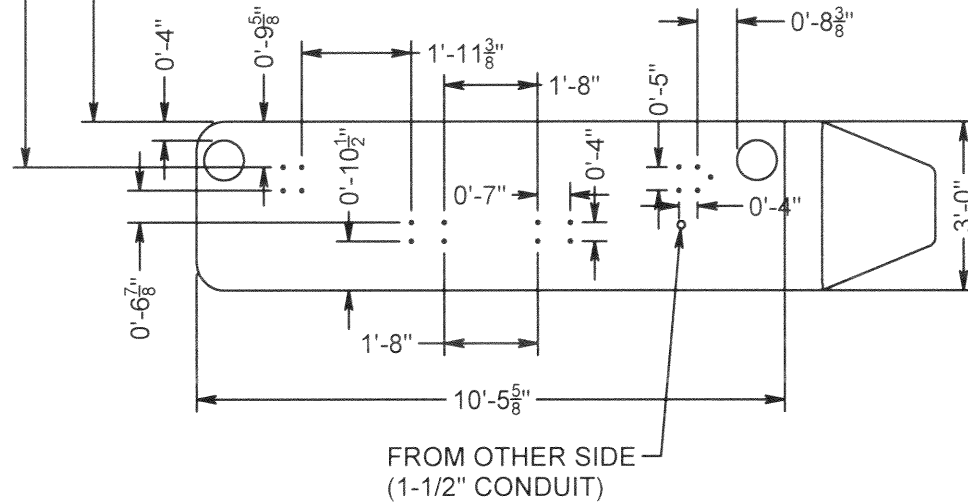
REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	8-3-06	JGW
2	ECF2837 CHANGED DET SPACING	11-13-20	ZJM



NOTE: SEE SHEET 294B FOR DETECTOR SPACING.

DIRECTION OF TRAFFIC



SEE SHEET 511X836(A) FOR CONCRETE AND ANCHOR BOLT DETAILS.

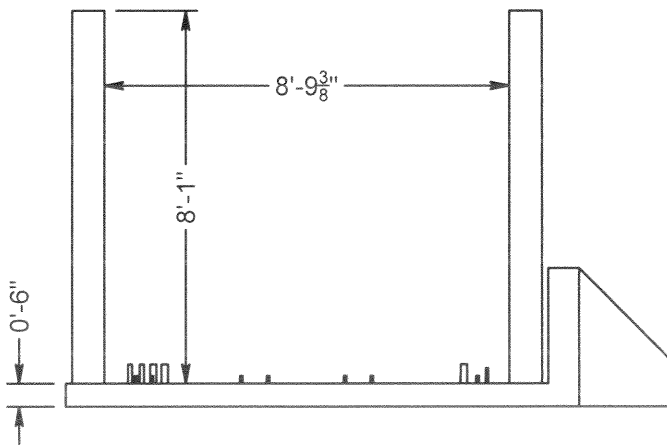
BOLLARDS ARE 8" PIPE OR SIMILAR, FILLED WITH CONCRETE. (NOT SUPPLIED)

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE, EVERYTHING SHOULD BE MOVED UP BY 18" AND ONLY TOP IR SENSORS USED.

SEE SHEETS 294, 294A, 294B, 294D

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL



DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP Jgw	DATE 11-20-20
DWG NUM: 4511-294			SCALE: --	
TITLE: M 4525-17500 PLAN VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 294C	

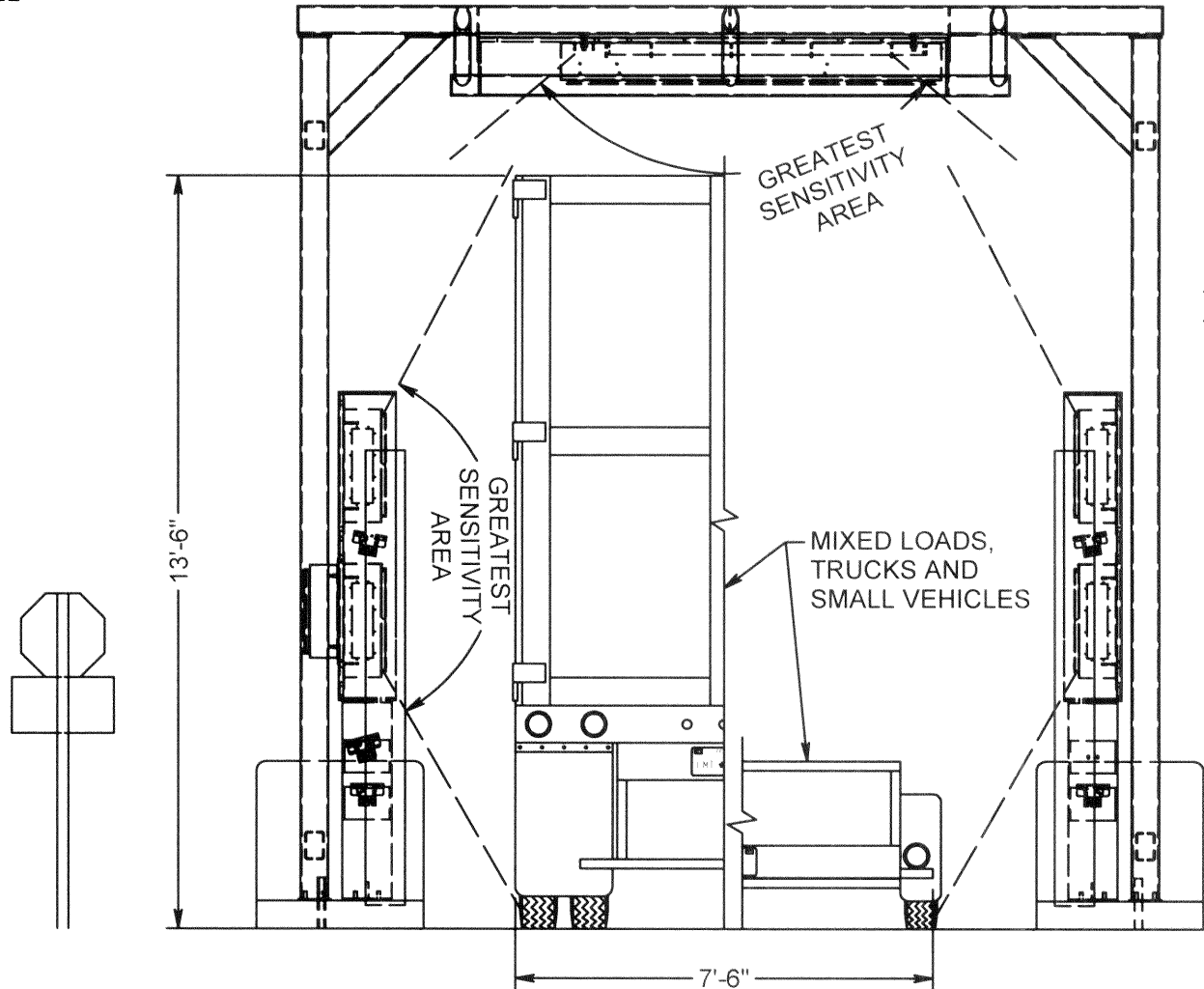
ALL DIMENSIONS ARE SUBJECT TO CHANGE
 DEPENDING ON SITE REQUIREMENTS

SEE SHEETS 294A, 294B, 294C, 294D

SEE SHEET 376D FOR BOTTOM STEEL
 CONSTRUCTION AND 375C FOR
 OVERHEAD STEEL

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	8-3-06	JGW
2	ECF2837 CHANGED DET SPACING	11-13-20	ZJM



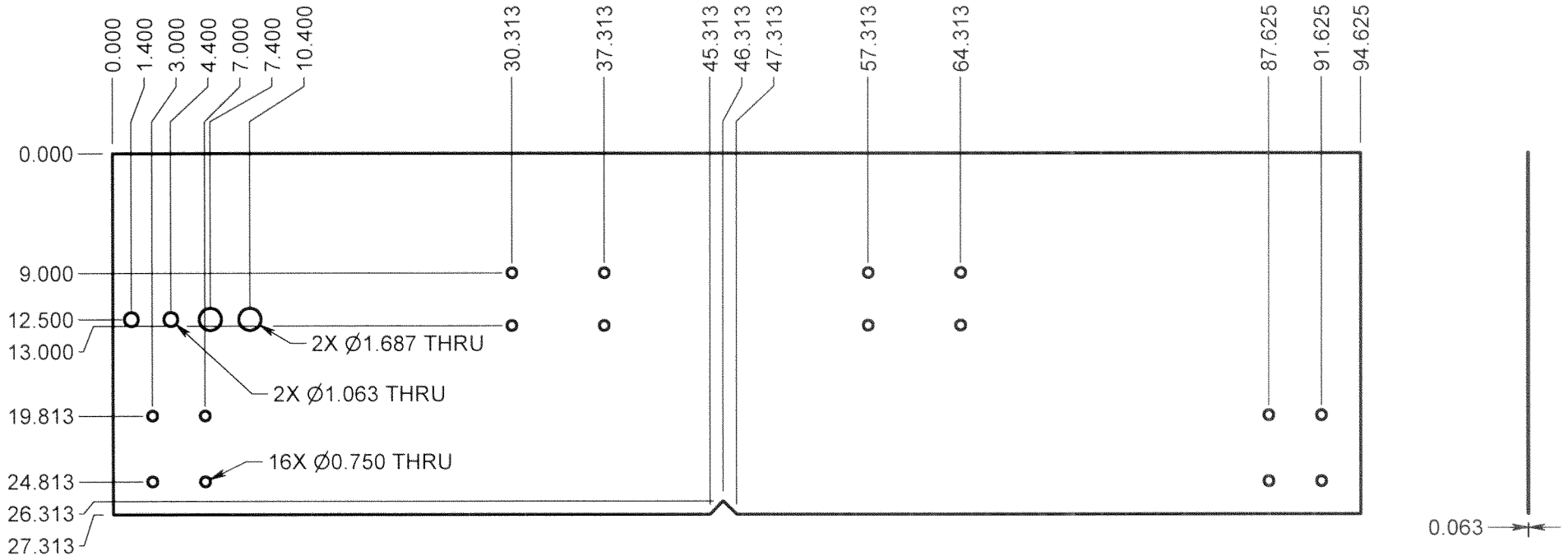
NOTE: FOR EXCLUSIVE TRUCK
 OR RAIL USE EVERYTHING
 SHOULD BE MOVED UP BY 18"
 AND ONLY TOP IR SENSORS
 ARE USED.

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

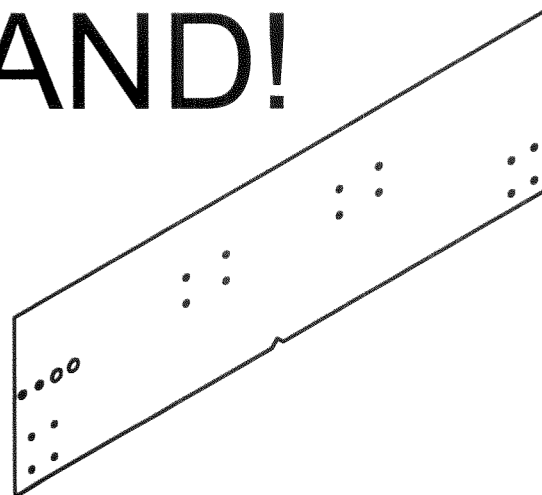
DWN ZJM	DATE 12/2/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 12-2-20
DWG NUM: 4511-294				SCALE: --
TITLE: M 4525-17500 SENSITIVE AREA				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 294D

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	9-4-14	CMC
2	ECF 5688 CHANGED PN#	9-21-20	ZJM
3	ECF 2837 MOVED ANCHOR BOLTS	11-13-20	ZJM



DO NOT SAND!



NOTE:
NOTCH IS FRONT
OF STAND FACING
TRAFFIC LANE.

DESC: ANCHOR BOLT TEMPLATE			
MODEL NO.: 4525-17500		PART NO.: 7384-1100-01	
MAT'L.: 16 GA HOT DIPPED GALVANIZED			
MAT'L. NO.: 37-9820		SIZE: 2585 SI	
SAND CLASS: --	PAINT CLASS: --	COVERAGE CLASS: --	
FINISH: CLEAN, DON'T SAND			SILK SCREEN: N
FINAL ASSY NO.: --		NO. REQ'D: 1	
DWN ZJM	DATE 11/13/2020	DESIGN AUTHORITY JGVWITT	APP JGVW DATE 11-13-20
TOLERANCES: UNLESS NOTED OTHERWISE MILL, LATHE, SHEETMETAL = ± 0.005			SCALE: 1/12
BENDS ON SHEETMETAL PARTS = ± 0.010 ANGLES = ± 1.0° ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE			
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 384	SHEET 1100

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 311A, 311B, 311C, 311D, 311E

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	10-4-13	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-17-20	ZJM

SWING AWAY OVERHEAD DETECTORS

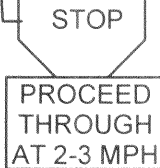
BOLLARDS ON THIS END IF TRAFFIC GOES BOTH WAYS

SCALE

DIRECTION OF TRAFFIC

CONTROL BOX

BUFFER ZONE (SEE SHEET 311B)



DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-311			SCALE: --	
TITLE: M 4525-21000 TYPICAL INSTALL				
LUDLUM MEASUREMENTS, INC. 301 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 311	

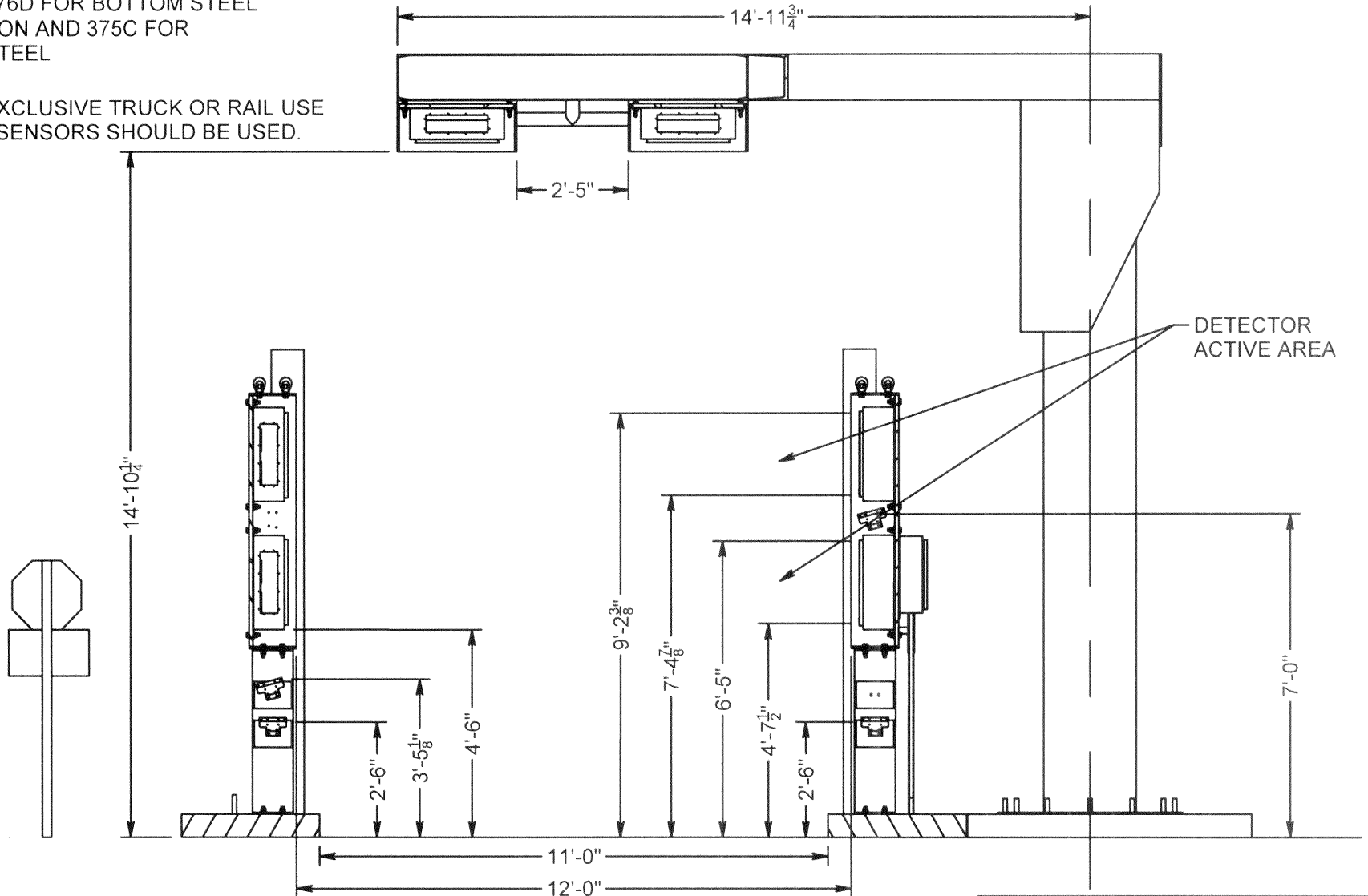
ALL DIMENSIONS ARE SUBJECT TO CHANGE
DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 311, 311B, 311C, 311D,
311E

SEE SHEET 376D FOR BOTTOM STEEL
CONSTRUCTION AND 375C FOR
OVERHEAD STEEL

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE
ONLY TOP IR SENSORS SHOULD BE USED.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	10-4-13	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-17-20	ZJM



NOTE: 12' SPACING FOR MAX
SENSITIVITY. SPACING SHOULD
NOT EXCEED 14'.
(SEE SHEET 311B)

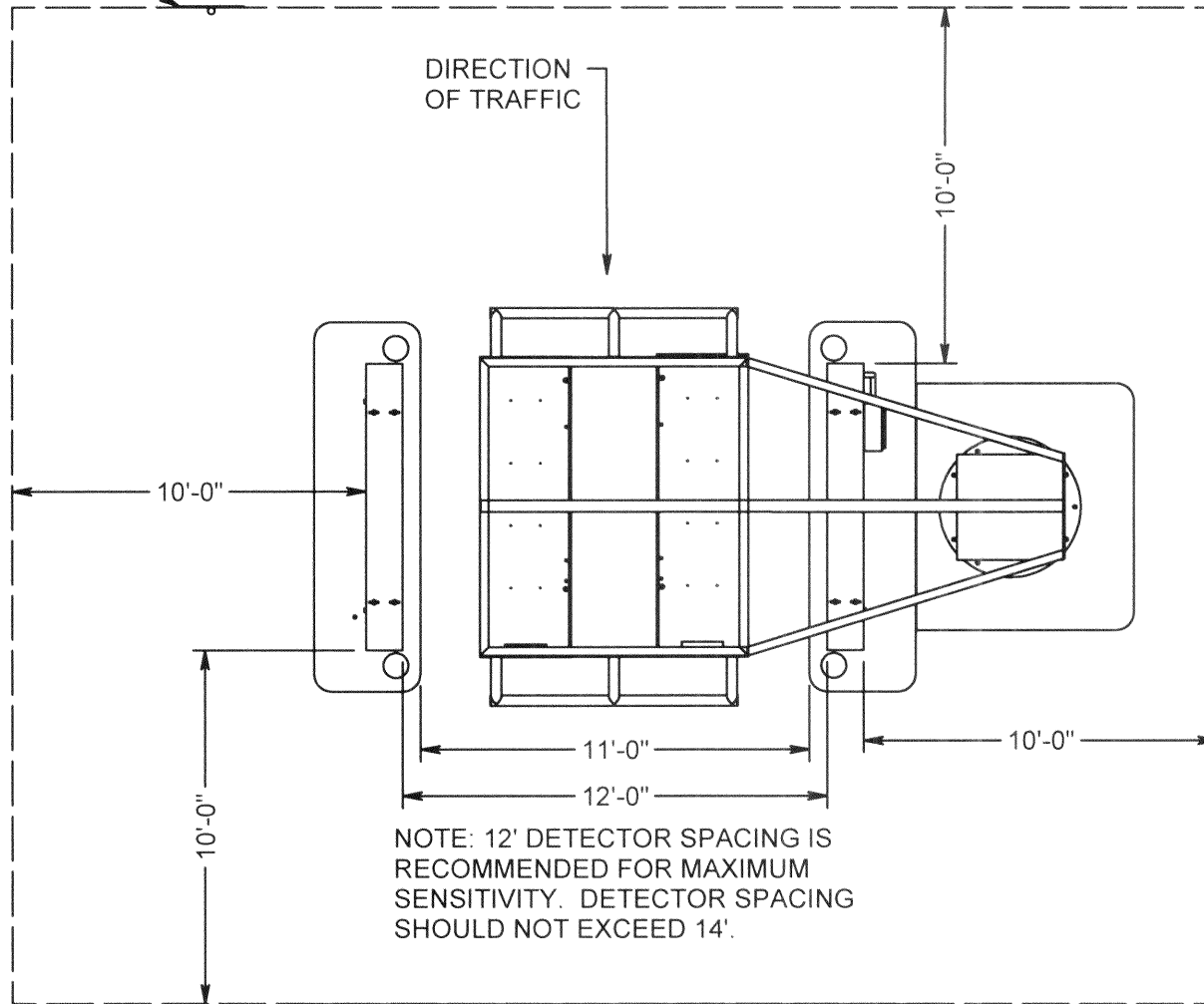
DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP Jaw	DATE 11-20-20
DWG NUM: 4511-311			SCALE: --	
TITLE: M 4525-21000 DET ELEVATION			SERIES 511	SHEET 311A
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556				



PROCEED THROUGH AT 2-3 MPH

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	10-4-13	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-17-20	ZJM



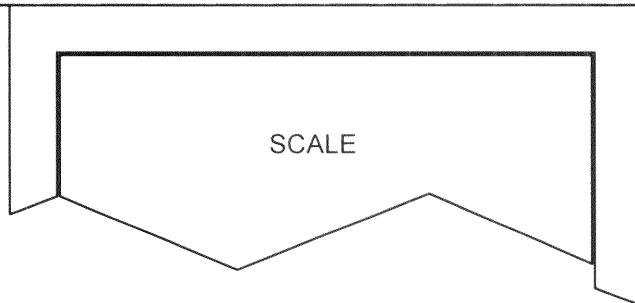
**BUFFER ZONE
KEEP THIS AREA CLEAR
FOR OPTIMUM SYSTEM
PERFORMANCE**

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.

SEE SHEETS 311, 311A, 311C, 311D, 311E

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL

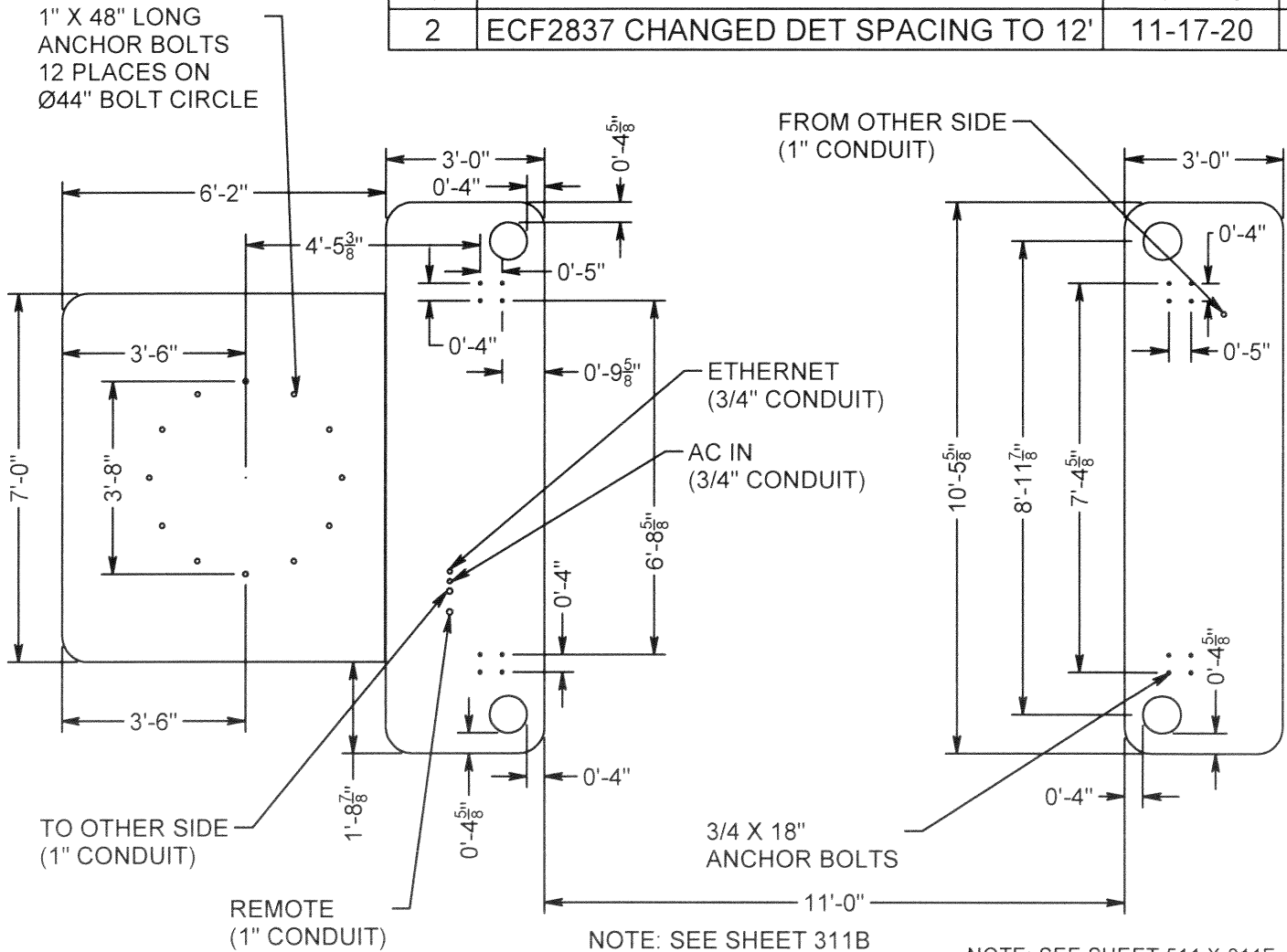


SCALE

DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-311			SCALE: --	
TITLE: M 4525-21000 AERIAL VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 311B	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	10-4-13	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-17-20	ZJM



NOTE: SEE SHEET 311B FOR DETECTOR SPACING.

NOTE: SEE SHEET 511 X 311E FOR CONCRETE AND ANCHOR BOLT DETAILS.

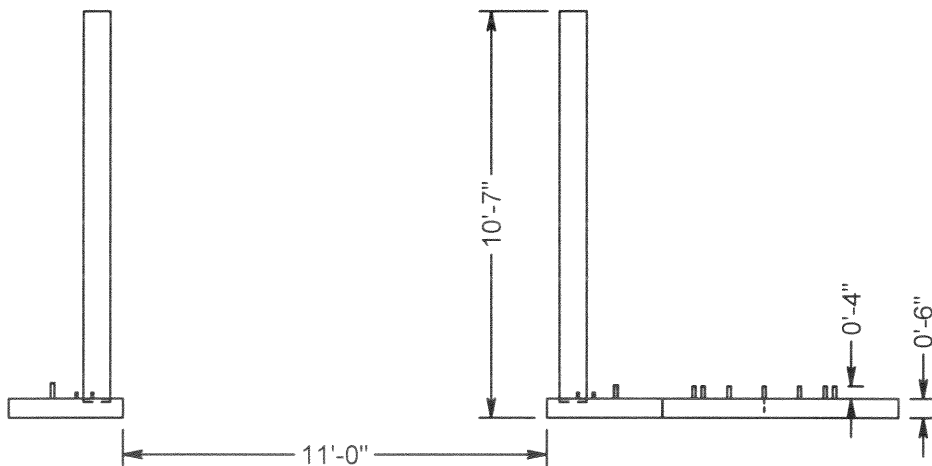
BOLLARDS ARE 8" PIPE OR SIMILAR, FILLED WITH CONCRETE (NOT SUPPLIED)

ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

NOTE: FOR EXCLUSIVE TRUCK OR RAIL USE EVERYTHING SHOULD BE MOVED UP BY 18" AND ONLY TOP IR SENSORS SHOULD BE USED.

SEE SHEETS 311, 311A, 311B, 311C, 311D, 311E

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL



DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP Jaw	DATE 11-20-20
DWG NUM: 4511-311				SCALE: --
TITLE: M 4525-21000 PLAN VIEW				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 511	SHEET 311C

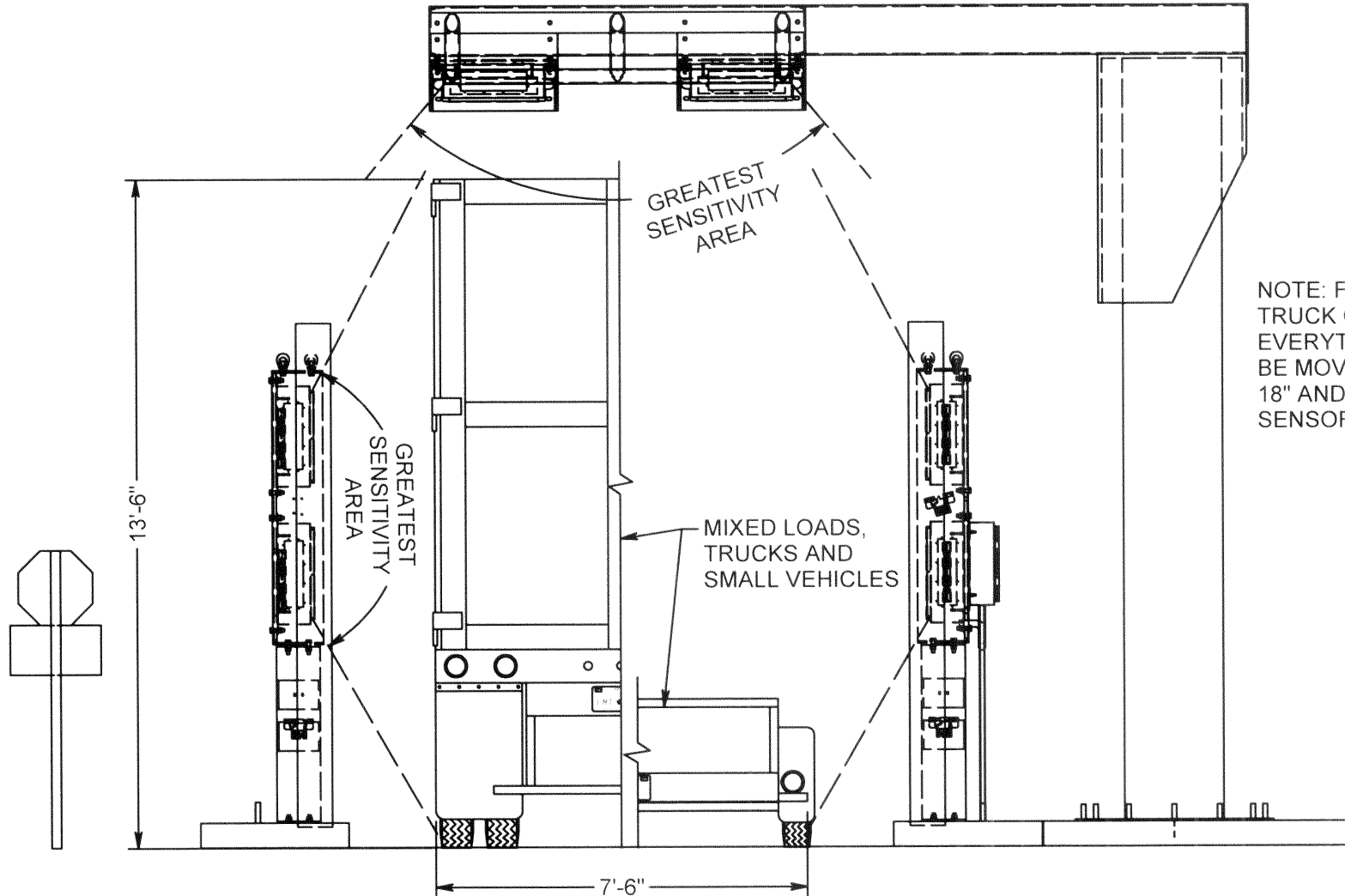
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 311, 311A, 311B, 311C, 311E

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	10-4-13	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-17-20	ZJM



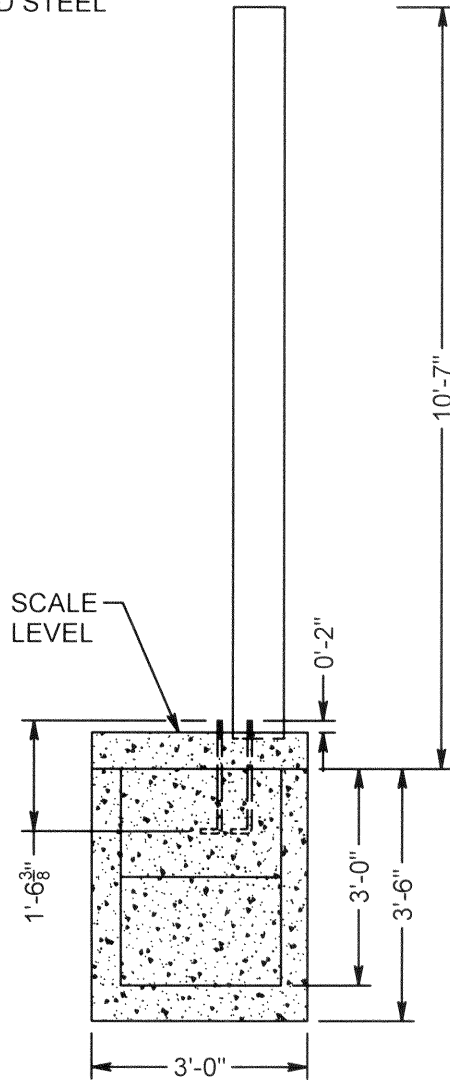
SENSITIVITY NOTE:
 AREA SHOWN IS THE GREATEST SENSITIVITY AREA. THE SYSTEM WILL DETECT RADIATION OUTSIDE OF THAT AREA, BUT WITH REDUCED SENSITIVITY.

DWN ZJM	DATE 12/2/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 12-2-20
DWG NUM: 4511-311			SCALE: ---	
TITLE: M 4525-21000 SENSITIVE AREA				
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 311D	

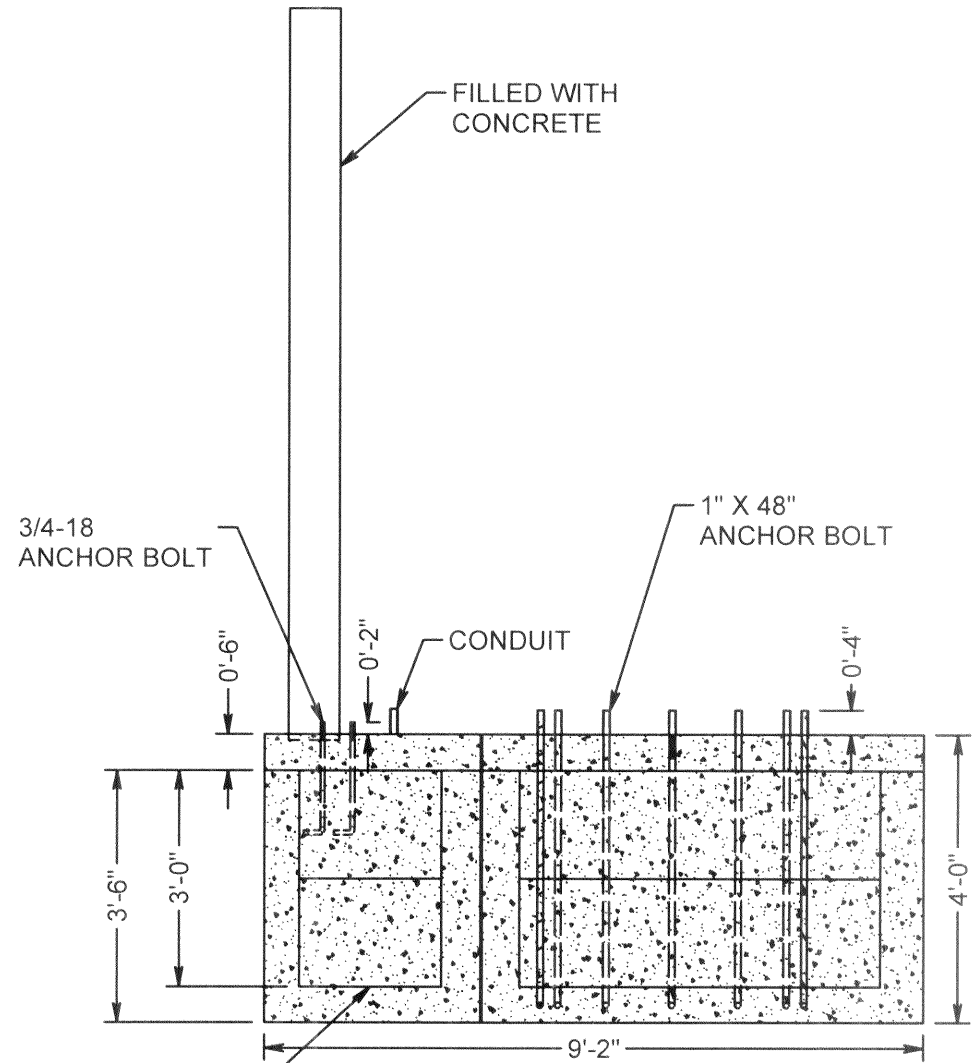
ALL DIMENSIONS ARE SUBJECT TO CHANGE DEPENDING ON SITE REQUIREMENTS.

SEE SHEETS 311, 311A, 311B, 311C, 311D

SEE SHEET 376D FOR BOTTOM STEEL CONSTRUCTION AND 375C FOR OVERHEAD STEEL



REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	10-4-13	CMC
2	ECF2837 CHANGED DET SPACING TO 12'	11-17-20	ZJM



CONCRETE GOES 42" BELOW THE GROUND

3/4" REBAR, 6" FROM TOP AND BOTTOM, BOTH DIRECTIONS 12" CENTERS.

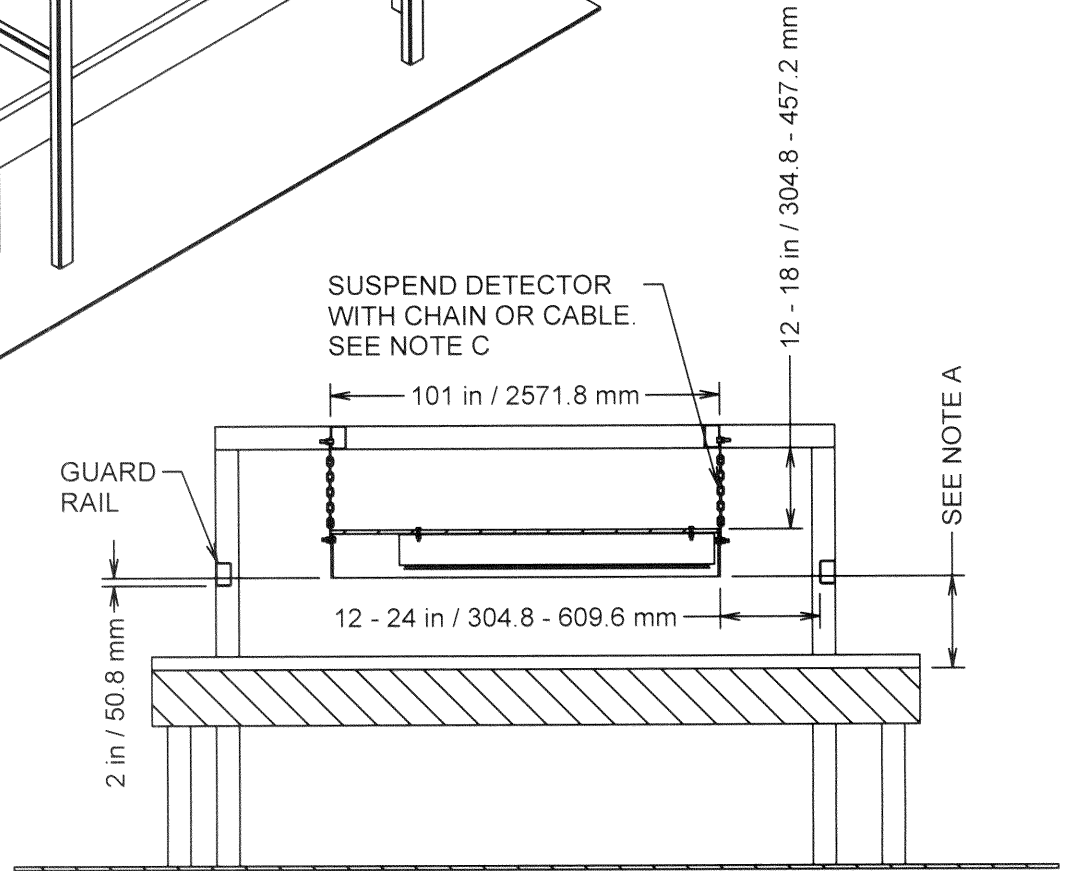
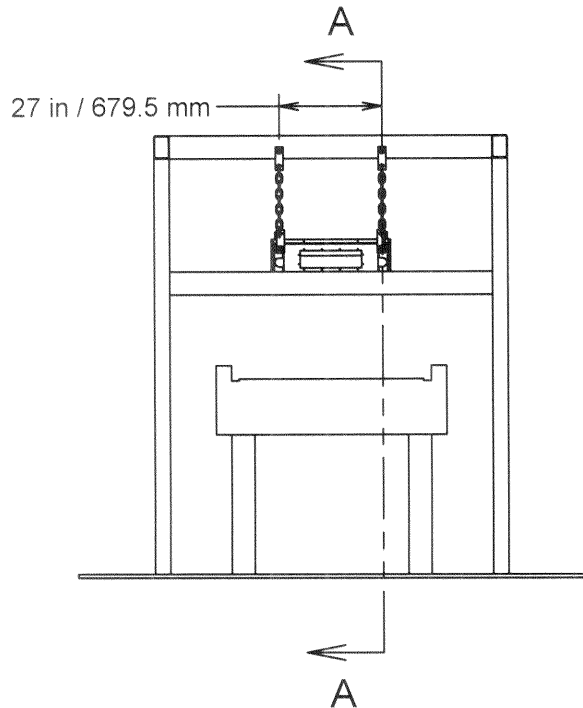
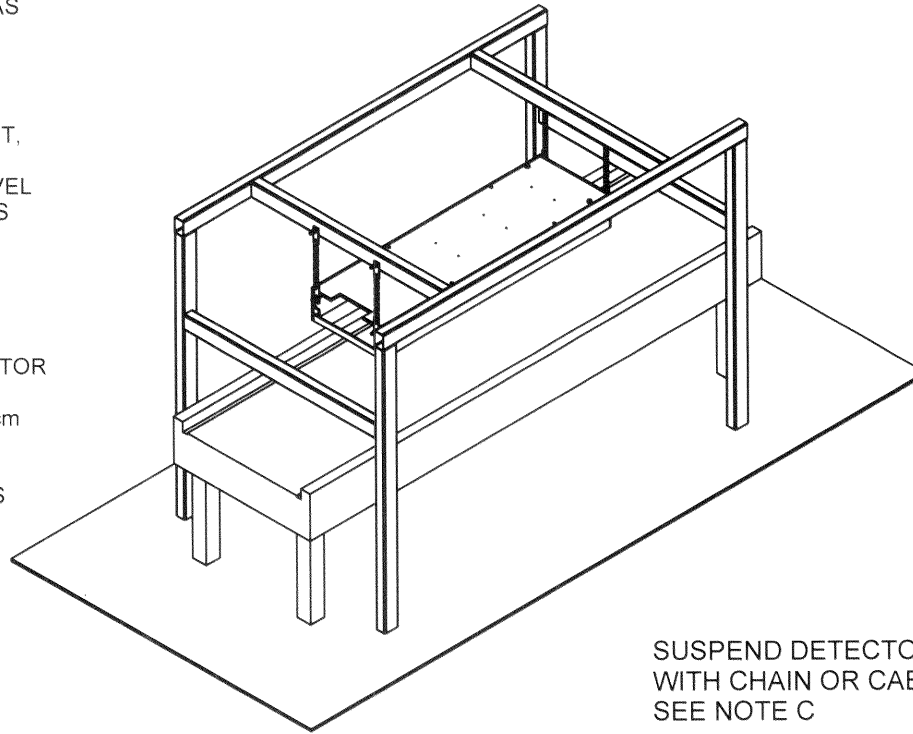
DWN ZJM	DATE 11/20/2020	DESIGN AUTHORITY JGWITT	APP JGW	DATE 11-20-20
DWG NUM: 4511-311			SCALE: --	
TITLE: M 4525-21000 CONCRETE				
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 511	SHEET 311E	

NOTES:

A) KEEP DETECTOR AS CLOSE TO MATERIAL AS POSSIBLE WITHOUT SUBJECTING IT TO CONTINUOUS IMPACTS.

B) KEEP DETECTOR CENTERED ABOVE CONVEYOR. IF CONVEYOR IS WIDER THAN 7FT, THE DETECTOR SHOULD BE TURNED PERPENDICULAR TO THE DIRECTION OF TRAVEL OF THE CONVEYOR OR MULTIPLE DETECTORS SHOULD BE USED.

C) WITH OPTIONAL SHIELD BOX AS SHOWN, WEIGHT OF UNIT IS APPROX. 2000 LBS. DETECTOR ALONE IS 600 LBS. IF SHIELDING BOX IS NOT USED, THEN DETECTOR SHOULD BE MOUNTED TO A STEEL PLATE, MINIMUM 0.500" THICK, MINIMUM OF 6" / 15.24 cm OVERHANG ON ALL SIDES OF DETECTOR. SUGGESTED CHAIN IS SIZE 1/4 OR LARGER, GRADE 80 OR BETTER. SUGGESTED CABLE IS 3/16 DIA OR LARGER.

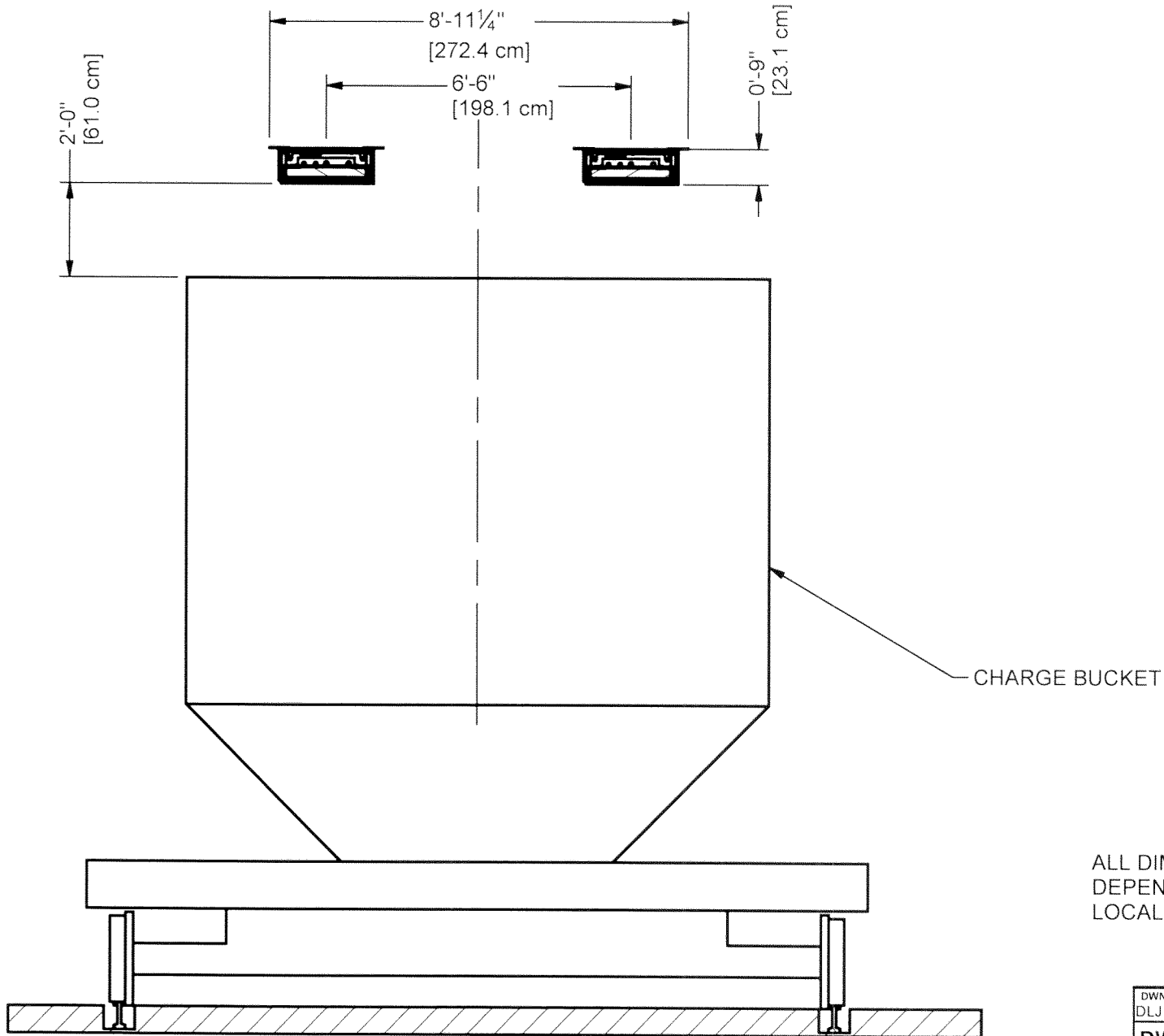


REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
1	VALID	3/12/2009	JGW

DWN	DATE	CHK	DATE	APP	DATE
CMC	1-3-2020			<i>[Signature]</i>	<i>[Signature]</i>
DWG NUM: 4396-957					SCALE: 1/50
TITLE M 375P/4525-3500 CONVEYOR INSTALL					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES 396	SHEET 957	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	9/9/19	DLJ



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

DWN	DATE	CHK	DATE	APP	DATE
DLJ	9/9/19			JW	9-9-19
DWG NUM: 4517-270				SCALE: 1/40	
TITLE M 4525-7000 ELEVATION					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES	SHEET		
		517	270A		

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

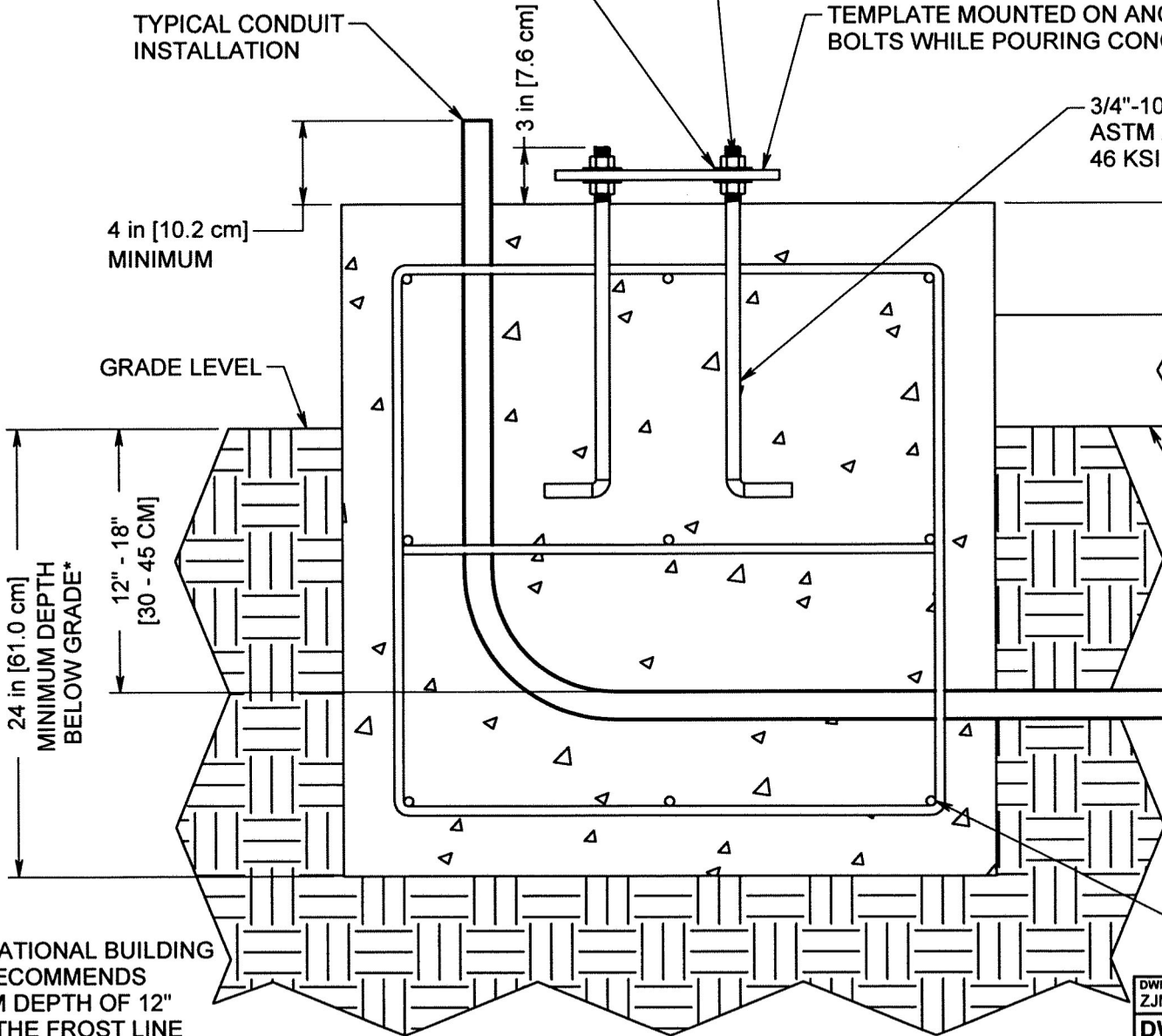
6 in [15.2 cm]

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

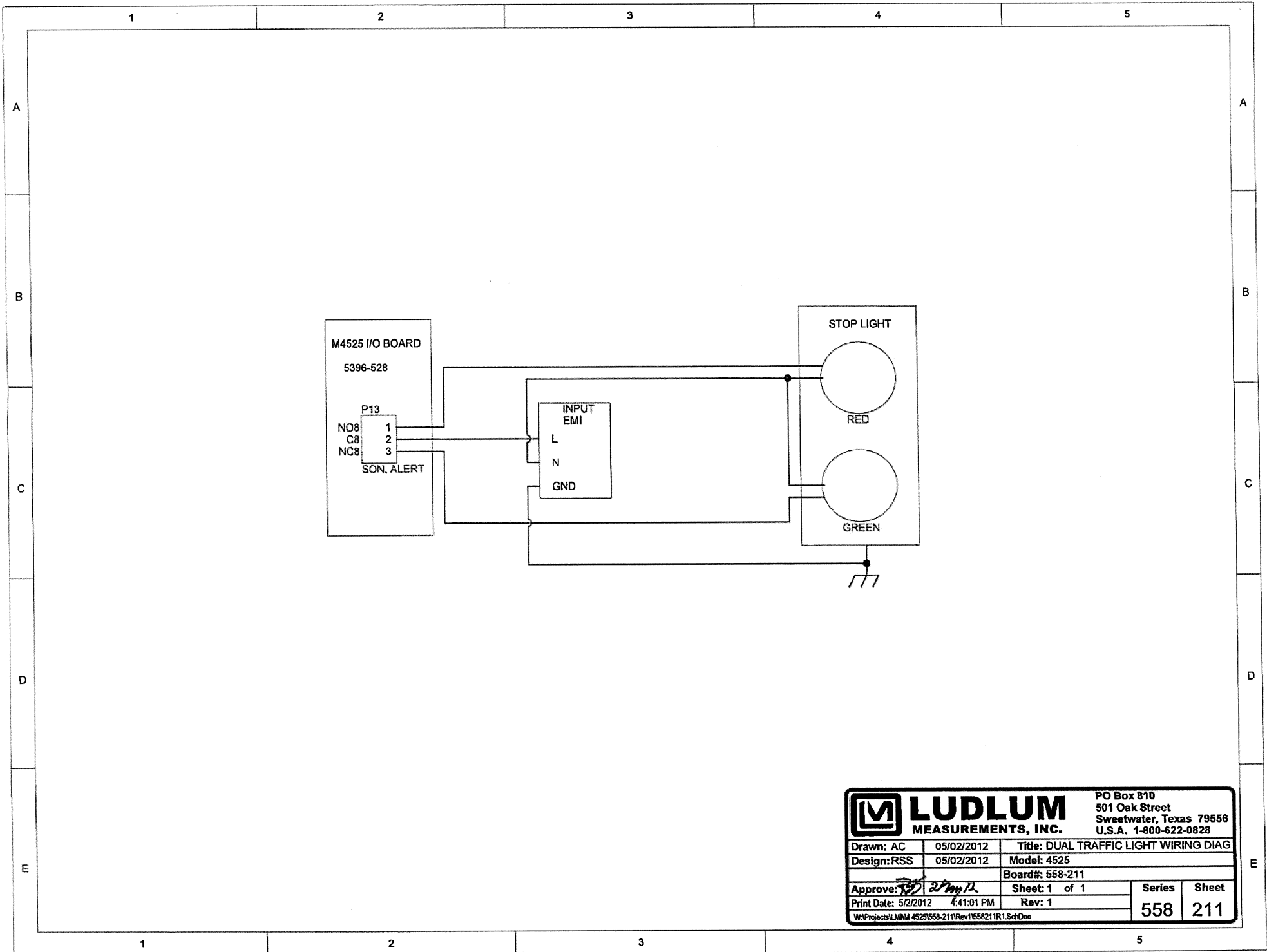


24 in [61.0 cm]
MINIMUM DEPTH
BELOW GRADE*

12" - 18"
[30 - 45 CM]

*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



		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
		Drawn: AC 05/02/2012	Title: DUAL TRAFFIC LIGHT WIRING DIAG
Design: RSS 05/02/2012	Model: 4525	Board#: 558-211	
Approve: <i>[Signature]</i>	Sheet: 1 of 1	Series	Sheet
Print Date: 5/2/2012 4:41:01 PM	Rev: 1	558	211
<small>W:\Projects\LMM 4525558-211\Rev1558211R1.SchDoc</small>			