

HydroLynx Systems, Inc.

**Model 5490
Satellite Water Level Station**

Instruction Manual



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Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify HydroLynx Systems immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. If the equipment was shipped via Parcel Post or UPS, contact HydroLynx Systems for instructions.

Returns

If equipment is to be returned to the factory for any reason, call HydroLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage during the return shipment. Call HydroLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available, take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with packaging. Please write the RA# on the outside of the box.

Warranty

HydroLynx Systems warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. HydroLynx Systems' obligations under this warranty are limited to, at HydroLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall HydroLynx Systems' liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by HydroLynx Systems, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

Address

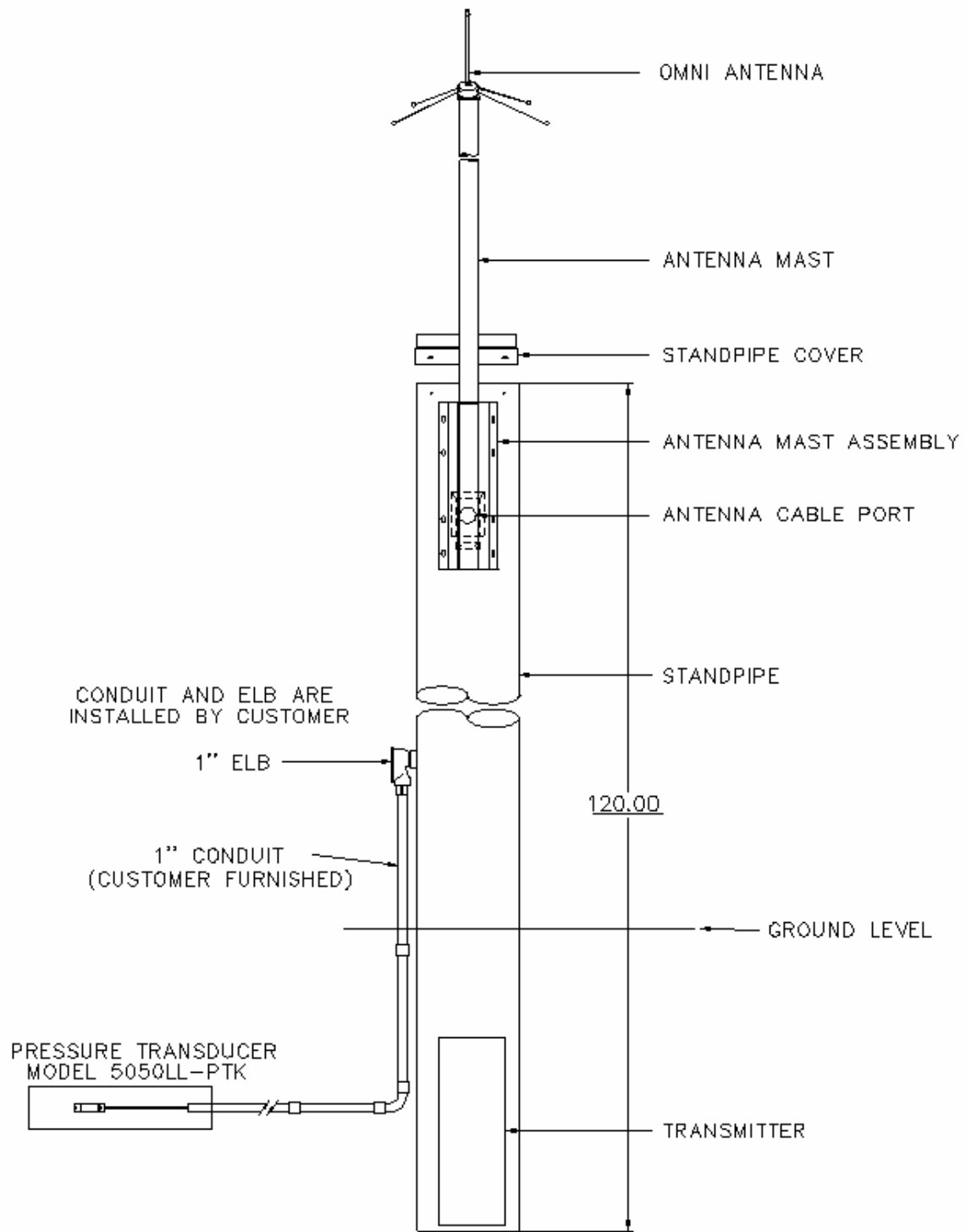
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Equipment Configuration and Parts Identification



1.0 INTRODUCTION

1.1 General Description

The Model 5490 Satellite Water Level Station includes a Model 5400 Satellite Data Transmitter, a 5050LL-PTD Pressure Transducer and a weatherproof standpipe assembly. The standpipe assembly eliminates the need for a gauge house and an antenna tower. The Model 5054TS Rain Gauge Top Section may be added to the package to monitor rainfall.

1.2 Equipment Included

- 1> Standpipe
- 2> Standpipe cap (or optional 5054TS)
- 3> Antenna mast
- 4> Antenna
- 5> Antenna cable
- 6> Data transmitter
- 7> Pressure transducer
- 8> Lifting rope
- 9> Access door (optional)

1.3 Specifications

Height of mast:	13'2" above ground level
Material:	Aluminum

2.0 INSTALLATION

There are two basic types of pressure transducer installations in ALERT applications: the first type has the sensor attached to a structure (bridge, pier, etc.), while in the second type the sensor is installed down an embankment without structural support. Other installations include: ground water wells, stilling wells, weirs, or in pressure lines replacing mercury manometers.

2.1 Site Selection

2.1.1 Data Collection

Site location is based foremost on hydrological gauge characteristics. Ideally the sensor location will include a uniform flow established across the entire width of the stream and a channel that is not subject to change due to excessive scouring or silting. A permanent installation with these characteristics will insure a stable hydrological record.

2.1.2 Radio Path

The satellite radio will communicate with any Orbcomm low earth orbiting satellite that is above the horizon and in line of sight.

2.1.3 Other Considerations

Easy access to the site for installation and especially maintenance will help insure a stable hydrological record. The sensor and conduit run must be protected from debris, boat anchors, fishing lines, and excessive current drag. There are no vandal-proof enclosures, however, some sites may be less prone to this type of damage than other high profile sites.

HydroLynx recommends a site visit during the dry season, to dimension and draw a plot plan. Use the plot plan to determine the measurement range and cable length of the pressure transducer and to plan for the construction materials that will be required during installation. See drawings AC102497, AC102504, and AC104747 for typical 5390 installations.

2.2 Assembly

The pressure transducer is shipped assembled. The PT cable must be disconnected from the desiccant box during installation. Refer to wiring diagram AC107407.

2.2.1 Standpipe

Refer to Basic Gauge manual for standpipe installation.

NOTE: Complete all civil works such as trenching, structural re-enforcement, or tree removal, before the standpipe is installed to avoid a situation requiring moving the standpipe.

2.2.2 Pressure Transducer

Each installation is unique which makes it difficult to provide step-by-step procedures covering every installation. Presented here are basic steps common to most installations. Refer to the typical installation diagrams.

- ! Install conduit from monitoring location to base of standpipe.
- ! Install standpipe.
- ! Drill 1 inch hole in standpipe to mount LB Box.
- ! Install conduit up standpipe to LB Box.
- ! Install LB Box.
- ! Route sensor cable through conduit and into standpipe.
- ! Connect sensor cable to desiccant box. Refer to drawing AC107407.
- ! Connect signal cable connector to the ANALOG port on the data transmitter.
- ! Test the gauge. Refer to the Basic Gauge Manual section 4.0.
- ! Place the data transmitter into the standpipe.

- ! Mount desiccant box to the bracket provided in standpipe.
- ! Attach cap (or optional 5054TS) to standpipe.

2.2.3 Installation Notes

The "gabion" or "anchor block" is used in installations where the pressure transducer is located away from the bank and usually involves a flat cable run. The sensor cannot be lowered into place so the cable is installed from the bottom up; typically, one inch conduit is used. This type of installation is not convenient for sensor replacement.

The PVC pipe is mounted to an existing structure or buried in the bank. The sensor slides down from an LB box until it rest on the placement screw; typically, 2" PVC pipe is used up to the LB box and half inch conduit from LB box to the standpipe. The LB box is mounted above the high water line for convenient sensor replacement.

For installations that involve long cable runs, the desiccant box may be installed outside the standpipe at a location above the high water line. This is meant to reduce the length, along with the cost, of the expensive vented pressure transducer cable.

3.0 THEORY OF OPERATION

The pressure transducer produces a 0-5 Vdc analog signal proportional to the liquid level above the sensor. The data transmitter converts the analog signal into water level reading in feet. Refer to Pressure Transducer and Data Transmitter manuals for operation.

Water level samples are taken at programmable intervals. Data is transmitted at a programmable timed interval or on a sample interval when the water level changes by a programmed amount. Data packets are sent through an Orbcomm satellite to a land based internet server where they are retrieved by your base station software.

4.0 TEST AND MAINTENANCE

4.1 Testing

Refer to Basic Gauge manual for standard tests.
Refer to Pressure Transducer manual for calibration.
Refer to Data Transmitter manual for sensor report setup.

4.2 Datum Point

The pressure transducer will measure the water level above the orifice, this is the Zero Datum Point (ZDP) for the sensor. The sensor ZDP must be referenced to an elevation for meaningful data reporting; this is done at the central site computer.

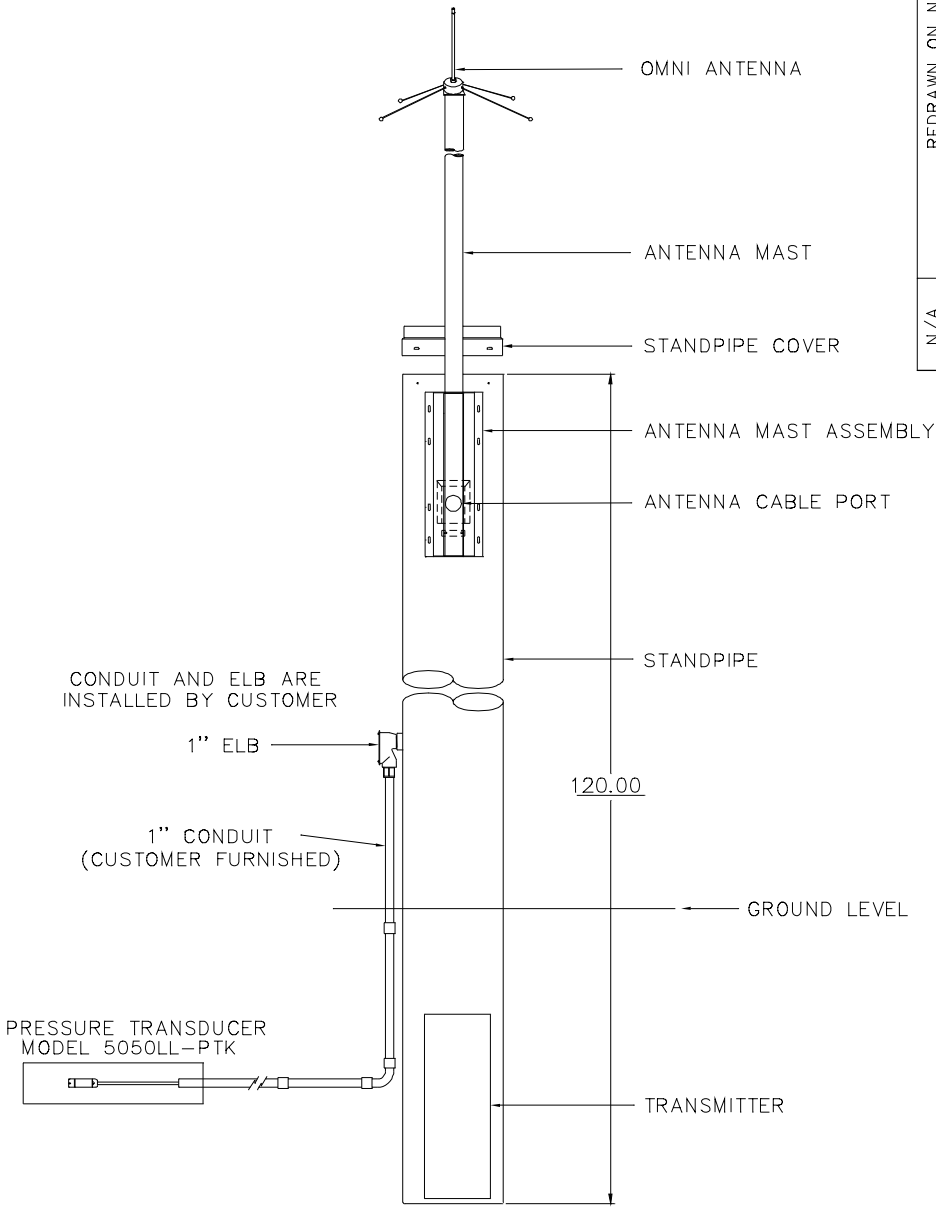
4.3 Maintenance

HydroLynx recommends annual maintenance for all gauges. In areas with heavy silting and other site specific considerations, maintenance may be required more often. Check the sensor installation for damage and debris when the level is at it's lowest.

The desiccant tube attached to the PT cable vent tube should be replaced when the desiccant color has changed from blue to pink. The desiccant bag should also be changed. Fresh desiccant is very important in preventing moisture from condensing in the sensor vent tube. Any moisture that collects in the pressure transducer vent tube will cause a failure.

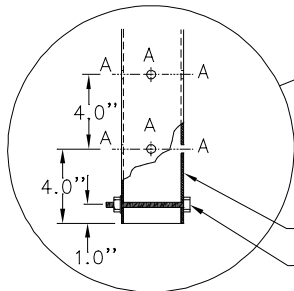
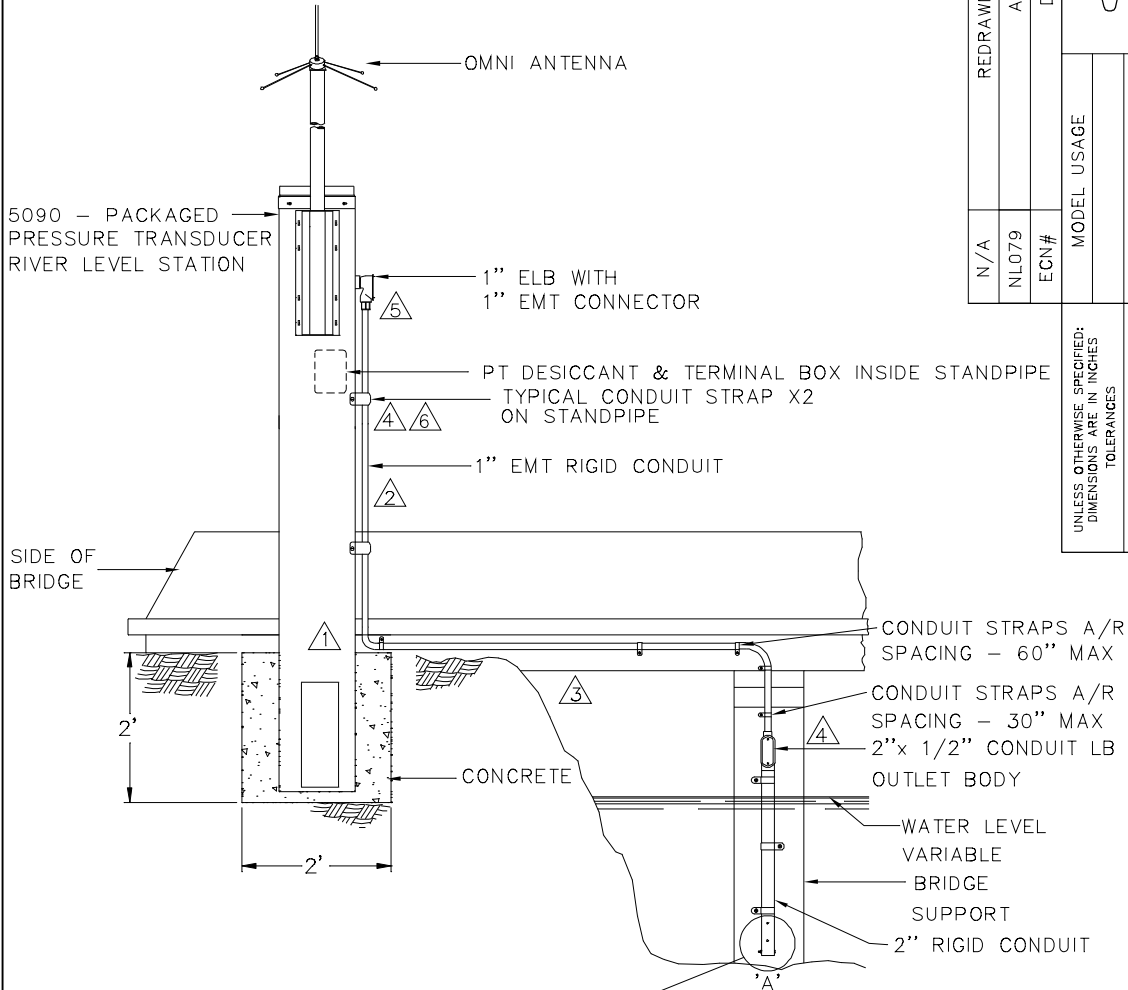
5.0 FORMS AND DRAWINGS

AC102305	Assembly - 5090 Packaged Pressure Transducer Liquid Level Station
AC104747	5090 Bridge Installation
AC102497	5090 River Bank Installation with Gabion Anchor
AC102504	5090 River Bank Installation with Anchor Block
AC107807	5050LL-PTD Enclosure Installation



N/A	REDRAWN ON NEW BORDER	6/3/99
ECN#	DESCRIPTION	DATE
HydroLynx		
MODEL USAGE	MODEL NO.	5090
	TITLE	PACKAGED PRESSURE TRANSDUCER
		LIQUID LEVEL STATION
DRAWN BY	DATE	DATE
J. MICHAELS	6/3/99	
CHECKED BY	SIZE	REV
	B	A
	P/WG NO.	AC102305

- NOTES
1. RIGID CONDUIT MUST BE USED FOR ALL BURIAL APPLICATIONS.
 2. 1" CONDUIT SHOWN. OTHER DIAMETERS MAY BE USED.
 3. LENGTH OF CONDUIT IS DETERMINED BY SITE REQUIREMENTS. INSTALL ONLY ON DOWNSTREAM SIDE OF BRIDGE SUPPORT.
 4. CONDUIT AND STRAPS ARE FURNISHED AND INSTALLED BY CUSTOMER.
 5. POSITION OF ELB BOX MAY VARY.
 6. INSTALL STANDPIPE CONDUIT STRAPS USING SHEET METAL SCREWS. SEAL SCREW HOLES AND SCREW HEADS WITH RTV.



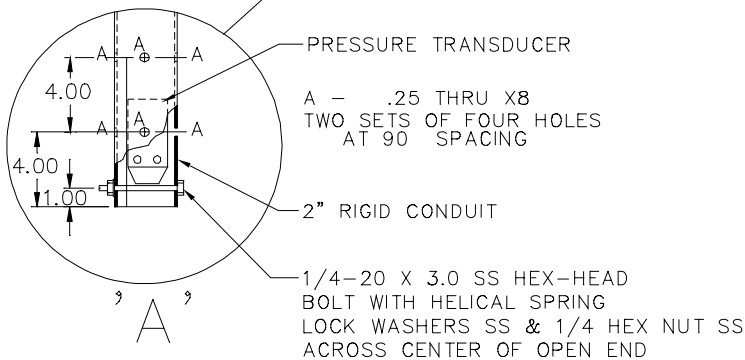
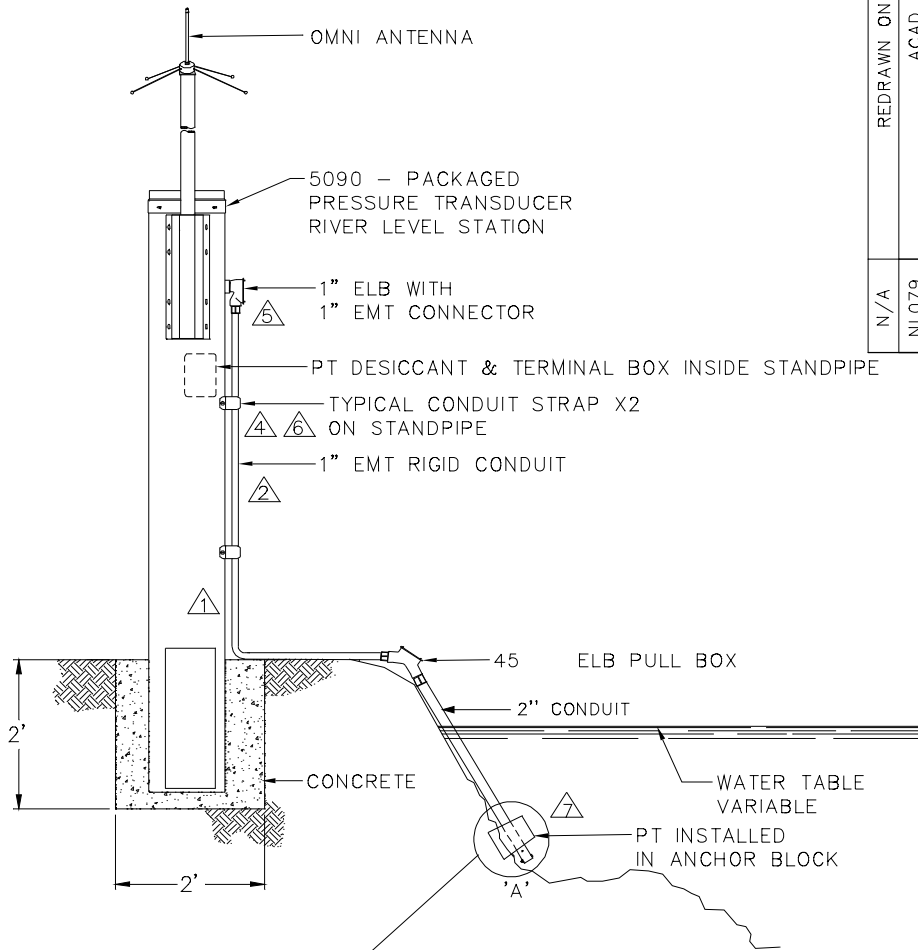
A- 1/4 THRU X8
TWO SETS OF FOUR HOLES
AT 90 SPACING

2" RIGID CONDUIT

1/4-20 x 3.0 SS HEX-HEAD
BOLT WITH 1/4" HELICAL SPRING
LOCKWASHERS SS & 1/4 HEX NUT SS
ACROSS CENTER OF OPEN END

N/A	REDRAWN ON NEW BORDER	5/28/99
NL079	ACAD REDRAW	2/2/96
ECN#	DESCRIPTION	DATE
MODEL USAGE		
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES		
FRACTIONS = ϵ N/A		
.XX = ϵ .01		
.XXX = ϵ .005		
WATL		
FINISH		
TREATMENT		
	HydroLynx	
	MODEL NO.	5090
	TITLE	TYPICAL BRIDGE CONFIGURATION
	DWG TYPE	
	DATE	5/28/99
DRAWN BY	R. BURKE	INSTALLATION
CHECKED BY		AC104747
	DWG NO.	REV
	B	B

- NOTES
1. RIGID CONDUIT MUST BE USED FOR ALL BURIAL APPLICATIONS.
 2. 1" CONDUIT SHOWN. OTHER DIAMETERS MAY BE USED.
 3. LENGTH OF CONDUIT IS DETERMINED BY SITE REQUIREMENTS.
 4. CONDUIT AND STRAPS ARE FURNISHED AND INSTALLED BY CUSTOMER.
 5. POSITION OF ELB BOX MAY VARY.
 6. INSTALL STANDPIPE CONDUIT STRAPS USING SHEET METAL SCREWS. SEAL SCREW HOLES AND SCREW HEADS WITH RTV.
 7. ANCHOR BLOCK IS FURNISHED AND INSTALLED BY CUSTOMER.

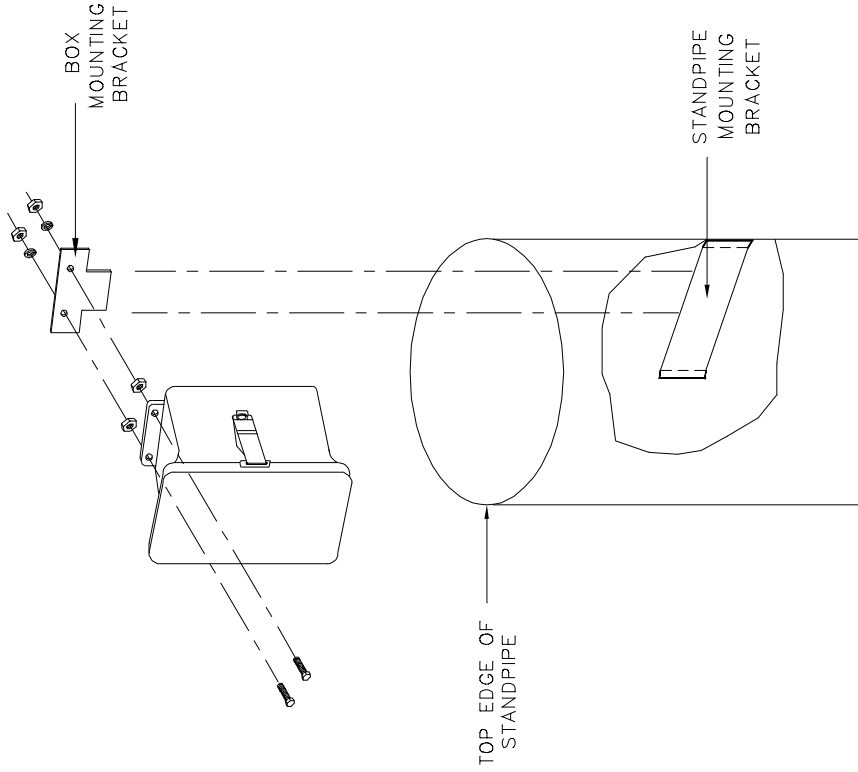


N/A	REDRAWN ON NEW BORDER	5/27/99
NL079	ACAD REDRAW	2/2/96
ECN#	DESCRIPTION	DATE
HydroLynx		
MODEL USAGE		MODEL NO. 5090
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES		TITLE TYPICAL RIVER BANK CONFIGURATION
FRACTIONS = ϵ N/A		DWG TYPE INSTALLATION
.XX = ϵ .01		DATE 3/27/99
.XXX = ϵ .005		SIZE B
MATERIAL		DWG NO. AC102504
FINISH		REV B
TREATMENT		
DRAWN BY J. MICHAELS		CHECKED BY

NEMA 4X
ENCLOSURE
(1522 OR 5050LL-PTK)

INSTALLATION NOTES:

1. MOUNT BOX BRACKET ONTO BOX FLANGE AS SHOWN.
2. LOWER BOX AND BRACKET INTO STANDPIPE.
3. SLIDE TAB OF BOX BRACKET DOWN AND BEHIND STANDPIPE BRACKET.
4. NEMA 4X BOX RESTS IN FRONT OF STANDPIPE BRACKET.



MODEL USAGE		HydroLynx	
1522, 5050LL-PTD			
MODEL NO.		5081, 5090	
TITLE		ENCLOSURE / STANDPIPE	
DRAWN BY		DATE	
K.KOELSCH		3/10/99	
CHECKED BY		DATE	
DWG TYPE		INSTALLATION	
SIZE		A	
DWG NO.		AC107807	
REV		A	

