

# SIKULIAQ & RCRV Scope of Supply



# R/V Sikuliaq – Scope of Supply

## Rapp Marine Winch Systems:

- Oceanographic Traction Winch System
- Two Hydrographic Winches
- Pentagon Research Control and Monitoring Systems

## Triplex CTD Overhead Launch and Recovery System (LARS)



# Oceanographic Traction Winch System

## Aft Oceanographic Traction Winch System

- Traction Winch
- Two Storage Drums and Level Winds
  - 10,000 meters - 0.680/0.681 EOM Cable
  - 10,000 meters - 9/16" diameter IWRC rope
- Nominal traction winch performance: 12 metric tons at 60 meters per minute
- Tension members leads to midship flag block leads to the Stern A-frame or Crane mounted block



# Hydrographic Winches

## Forward Hydrographic Winch Room

- Two Hydrographic Winches
  - 10,000 meters - 0.322 EM Cable
  - 10,000 meters - 0.322 EM Cable  
(Capable of holding 10,000 meters of 3/8" 3x19 wire rope)
- Nominal winch performance: 8 metric tons at 60 meters per minute or 5 metric tons at 90 meters per minute first layer
- Both winches mounted on turntables, so both tension members can lead to either Triplex LARS or midship flag block



# Pentagon PLC Control & Monitoring

## Pentagon Research Control and Monitoring Systems

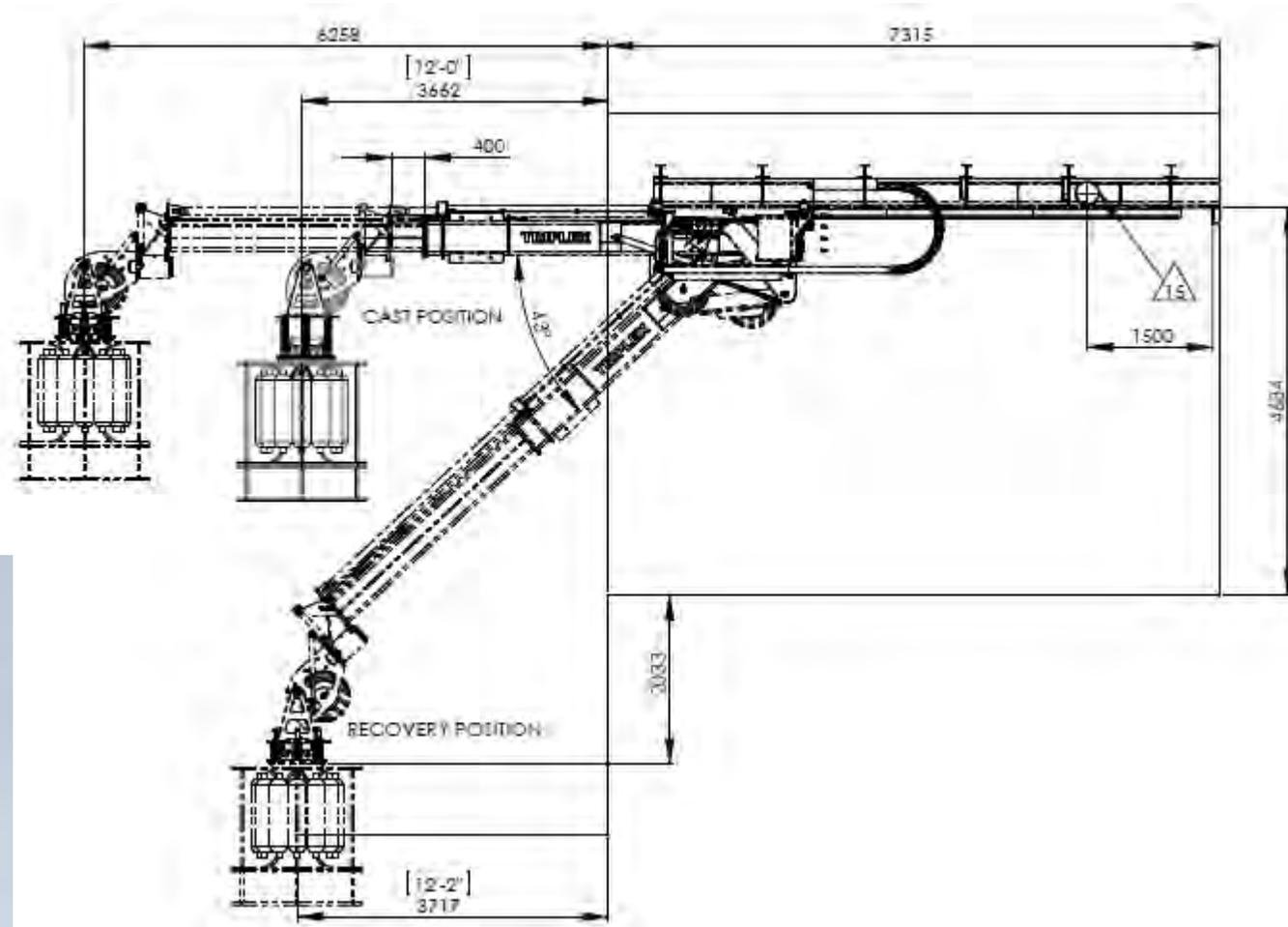
- The system monitors and controls the speed, line pull, power/amp and wire length as well as Active Heave Compensation of all winches
- Logging of each sequence according to user specification is integrated in the system at 20 Hz
- Fully compliant with UNOLS Appendix A requirements
- Data captured and logged is transferred to Data Broker, which then transfers into Sikuliaq's Science Data Subnet



# CTD Overhead Launch & Recovery System

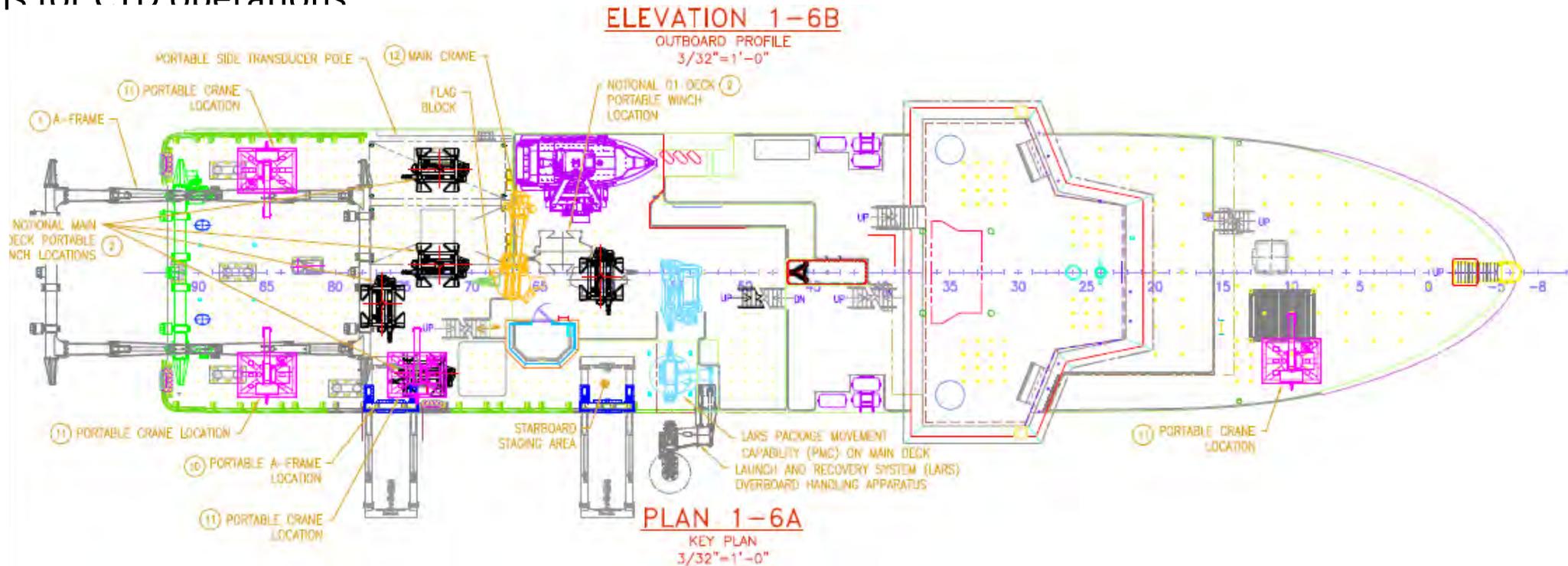
## Triplex CTD Overhead Launch and Recovery System (LARS)

- Configured to deploy scientific equipment over-the-side through the Baltic Room door on the starboard side of the vessel
- Rated to handle a maximum working load of 11,100 lbs.
- Overhead configuration saves space on deck



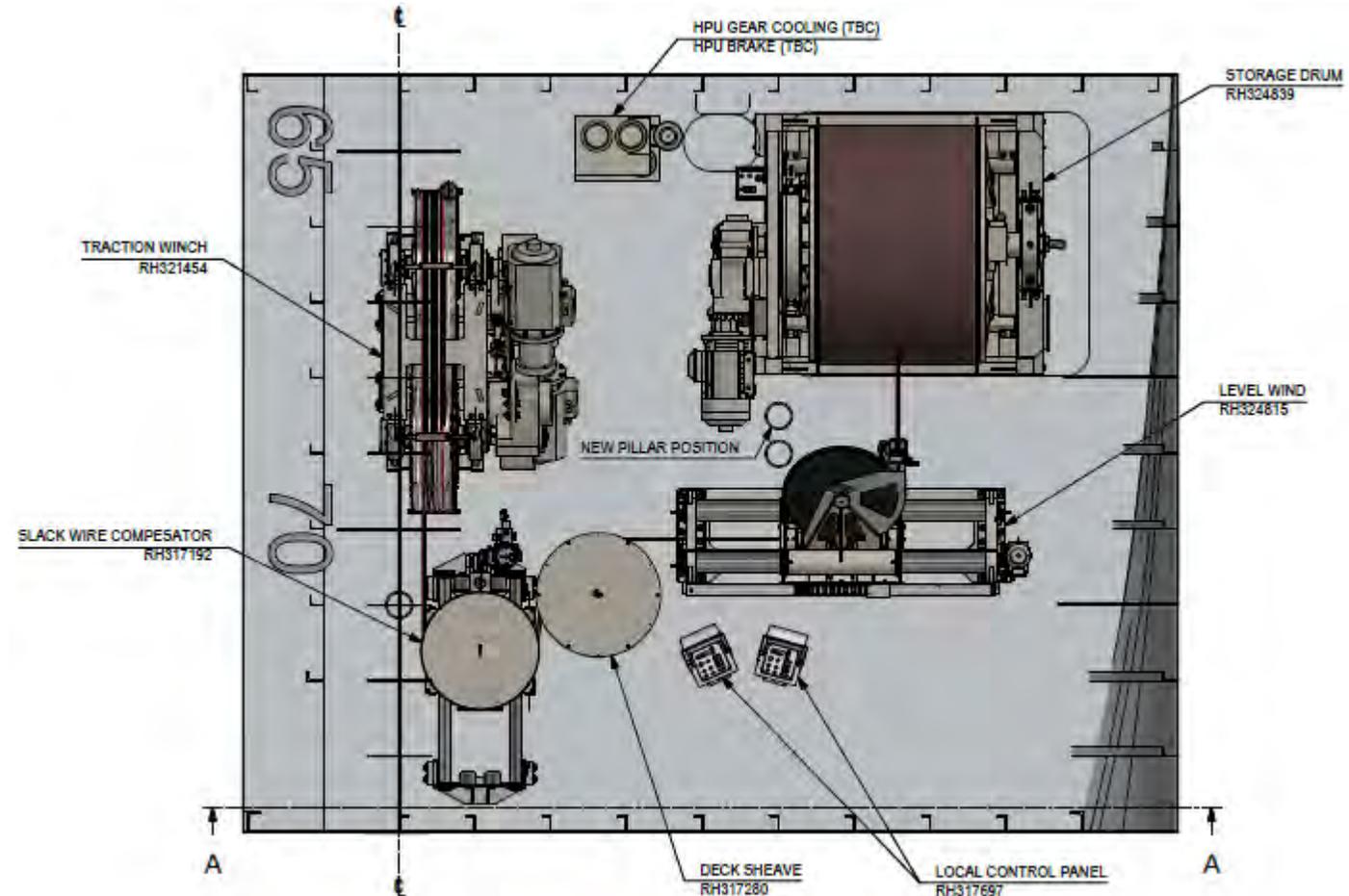
# RCRV OHS SSV Scope of Supply

- Winch Systems
  - Oceanographic Winch System (Interchangeable Drums)
  - Hydrographic Winch System (Interchangeable Drums)
  - Portable Winch
- Stern and Portable A-Frames
- Overboard Handling Apparatus (CTD Davit) and supporting systems for CTD operations
- Main and Portable Cranes
  - Individual HPUs for each crane
- Sheaves and Blocks
- Portable Tugger Winches
- Port Side Transducer Pole
- Central HPU for Triplex handling systems
- Fully integrated control system



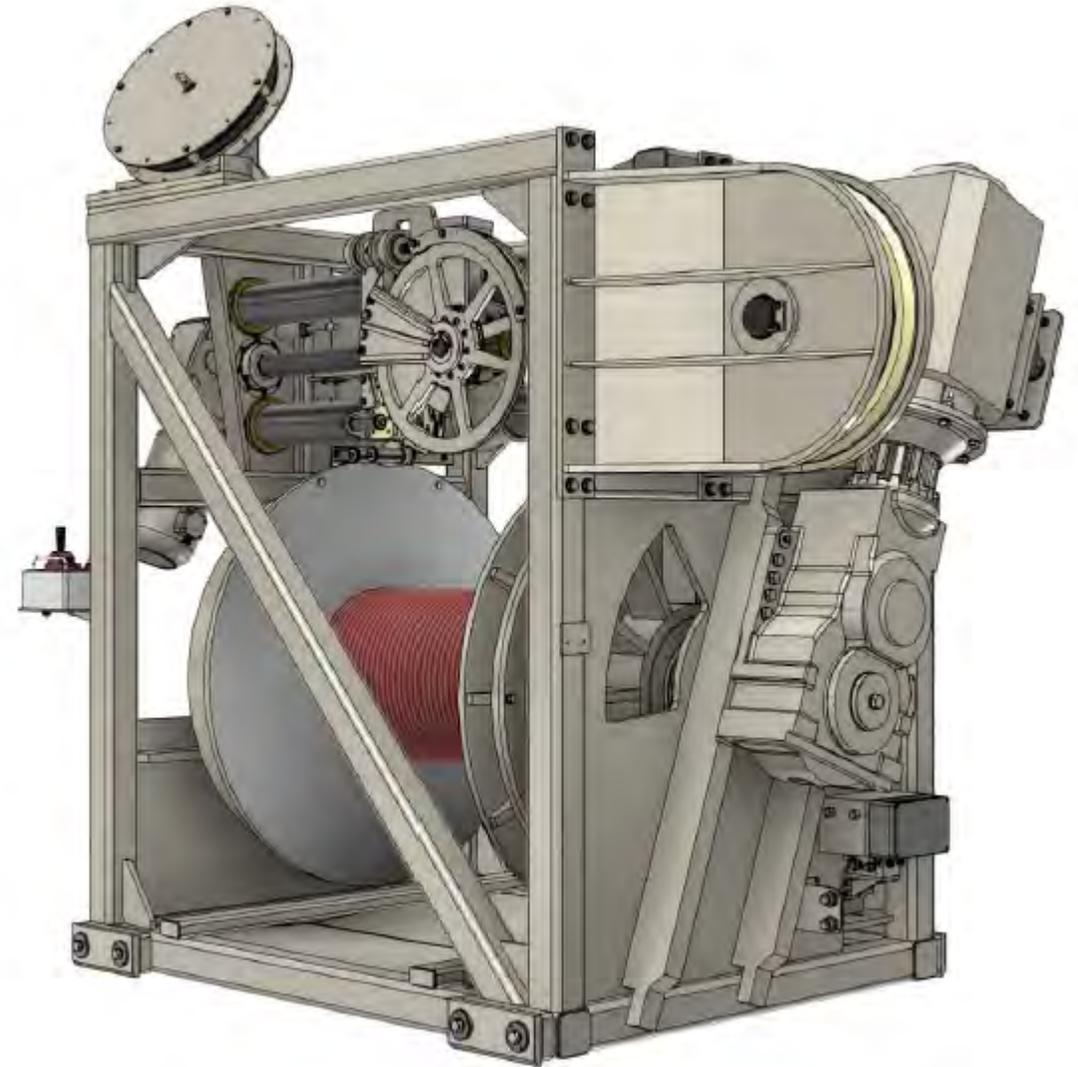
# Oceanographic Winch System

- Traction/Tow Winch System indoors/  
below main deck
- Nominal traction winch performance: 15  
metric tons at 60 meters per minute, or  
9 metric tons at 100 meters per minute
- Storage Drum designed for  
interchangeable drums that holds the  
following:
  - 10,000 meters of 9/16" Wireco  
Steel Wire Rope
  - Up to 10,000 meters of Rochester  
A310114 .681" EOM Cable
  - Up to 10,000 meters 5/8" synthetic  
rope
- Electric level wind for independent  
spooling control
- Slack Wire Compensator included
- Oceanographic tension member fed to  
either Stern A-Frame or Main Crane



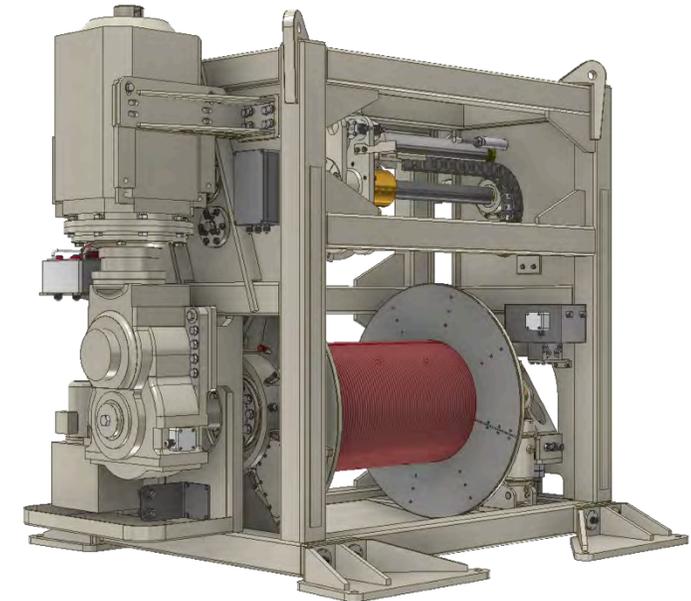
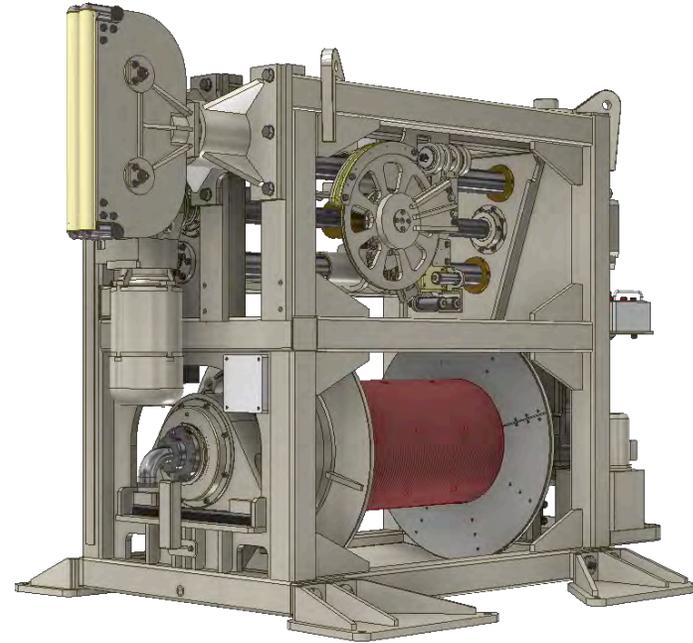
# Hydrographic Winch System

- Hydrographic Winch installed on 01 deck
- Nominal winch performance: 8 metric tons at 60 meters per minute first layer, or 5.4 metric tons at 90 meters per minute
- Hydrographic winch designed for interchangeable drums that holds the following:
  - 10,000 meters of Rochester A302351 .393" EOM Cable
  - 10,000 meters 3/8" synthetic rope
  - ~7,000 meters 13 mm synthetic hybrid cable-rope
- Electric, 90 degree top angle level wind for independent spooling control
- Hydrographic tension member fed to Starboard CTD Davit (Overboard Handling Apparatus)
- Extra sheave on top of frame for routing portable winch wire to CTD davit



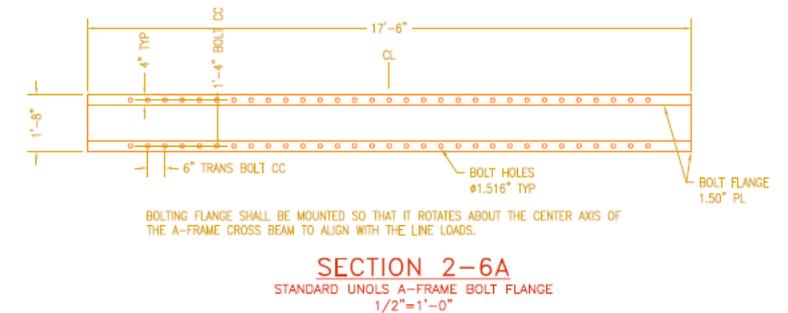
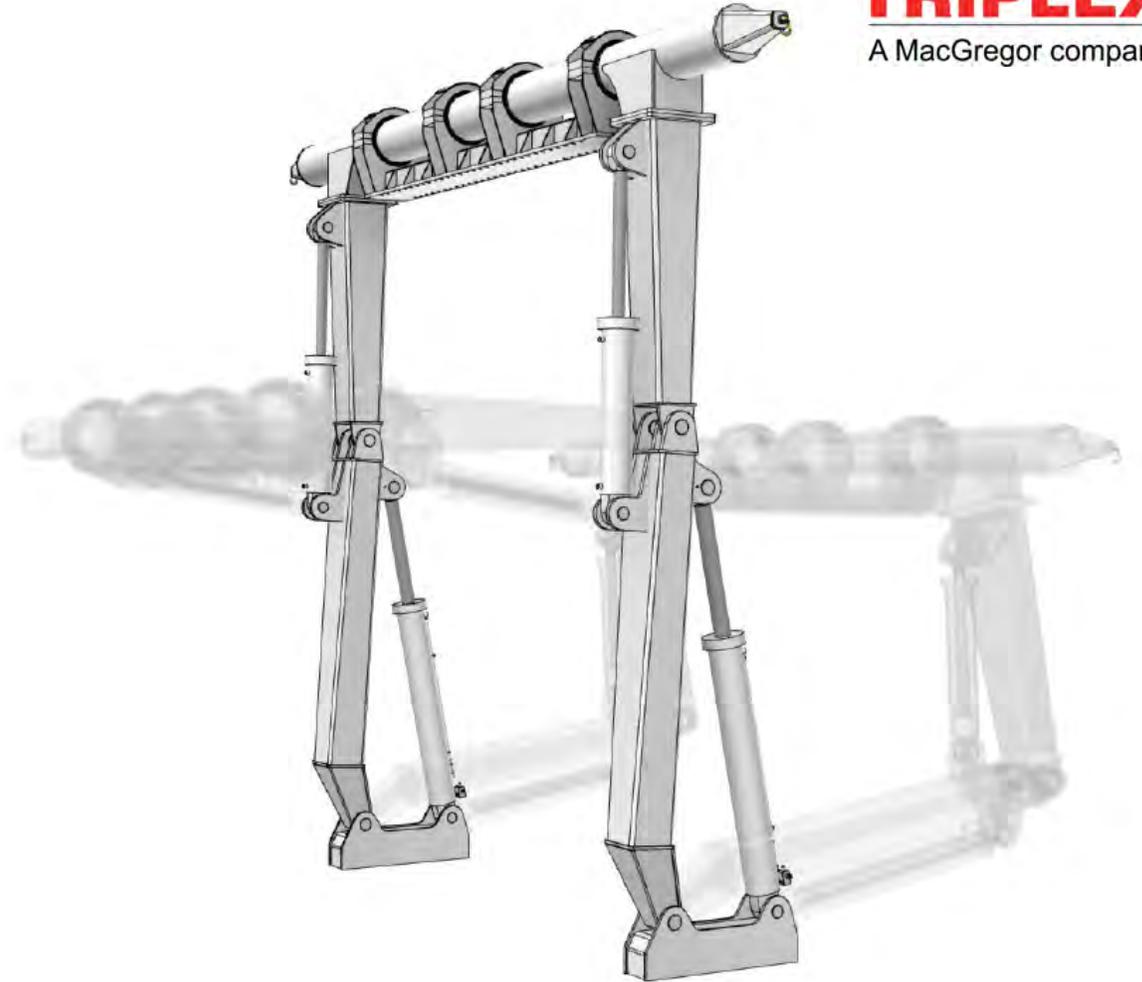
# Portable Winch

- Multiple mounting positions on main and 01 deck levels for portable winch
- Nominal winch performance: 5 metric tons at 60 meters per minute first layer, or 3.3 metric tons at 90 meters per minute
- Portable winch designed to hold the following:
  - 7,000 meters of Rochester A301592 .322" EM Cable
- Electric, 90 degree top angle level wind for independent spooling control
- Winch fitted on integrated mounting skid for portable handling/positioning made to fit the 2x2 bolt pattern on the deck.
- Rotating/swivel sheave head allows wider fleet angle from winch to handling system
- Portable winch tension member fed to stern A-frame, portable side A-frame, CTD Davit (Overboard Handling Apparatus), and portable crane



# Stern A-Frame

- Double articulating A-frame permanently mounted to the stern
- 20' Wide by 25' tall clear opening
- Extends outboard to 15' ft. (plumb) in primary position; cross bar 6', above design waterline in secondary position.
- Designed to handle up to 51,705 lbs. (230 kN) DLT
- Includes rotating trunnion with standard UNOLS A-Frame bolting flange
- Six bolt-on padeyes and two Pullmaster PL2 tugger winches
- Three LED lights mounted on crossbar
- Removable wingtips on each ends with two padeyes.



# CTD Davit & Supporting Systems

- Overboard Handling Apparatus with docking head
- Parking position on starboard side, 01 deck
- Extends outboard 8', 10", and downward 12', 1"
  - Docking head at 2', 11" above sea level during deployment/recovery position
- DLT of 16,200 lbs (72 kN) in cast position, SWT of 3,150 lbs (14 kN) during tow position
- Works primarily with Hydrographic winch system tension member
  - Also can use portable winch tension member
- Rapp Marine will supply hydraulic system for bulwark door system that opens and closes during operation
- Triplex will supply a removable package movement capability that moves CTD rosette from wet lab to deck using conveyer system, electric motor driven



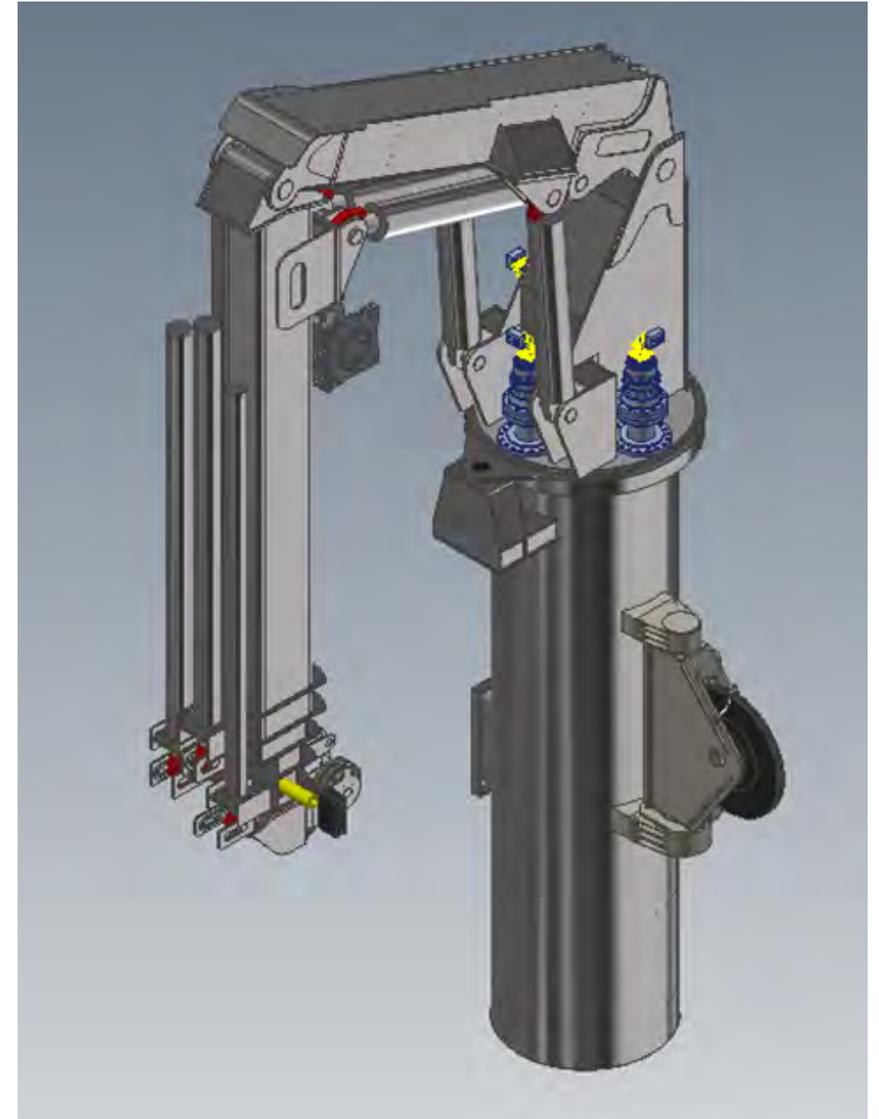
# Portable Side A-Frame

- Single articulating side A-frame
- Two mounting locations on deck, main deck and 01 deck
- Designed to overboard .322 wire, works with portable winch
- 5' wide 14' tall clear opening
- Extends to 10 ft. outboard.
- DLT of 16,200 lbs (72 kN) in cast position, SWT of 6,070 lbs (27 kN) during tow position
  - 45 degrees max inboard/outboard angle
  - 60 degree max tow angle aft
- Includes three bolt-on padeyes



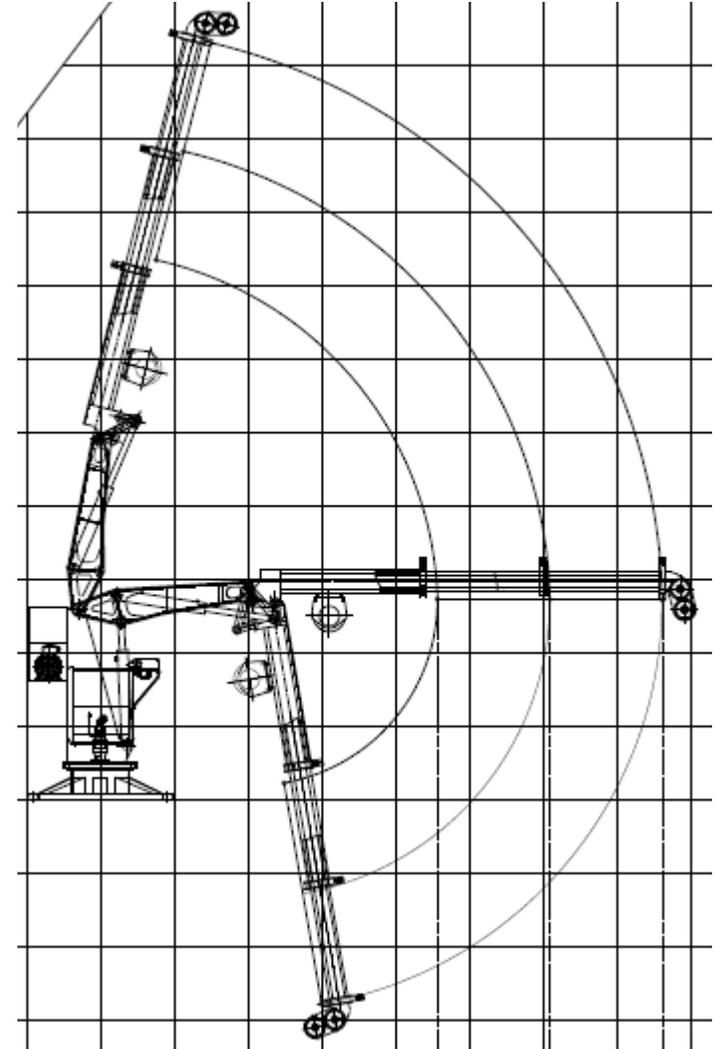
# Main Crane

- Telescopic knuckle boom crane
- Extends to 55' ft., folds in 12' ft.
- Designed to handle 15,000 lbs. static load at 50 ft., 7,500 lbs. dynamic load at 50 ft.
- Mechanical locking pin on slew bearing for towing mode, DLT up to 11,600 LBF
  - 45 degrees max inboard/outboard angle
  - 60 degree max tow angle aft
- Includes crane winch – rated for 8,000 lifting on single part rigging, includes 2 and 4 parted rigging options (up to 17,500 lb. and 35,000 lb., respectively)
- Also can use tension members from oceanographic winch system, portable winch (on main deck)
- Oceanographic winch system tension member feeds from flag block mounted on crane pedestal to stern A-frame

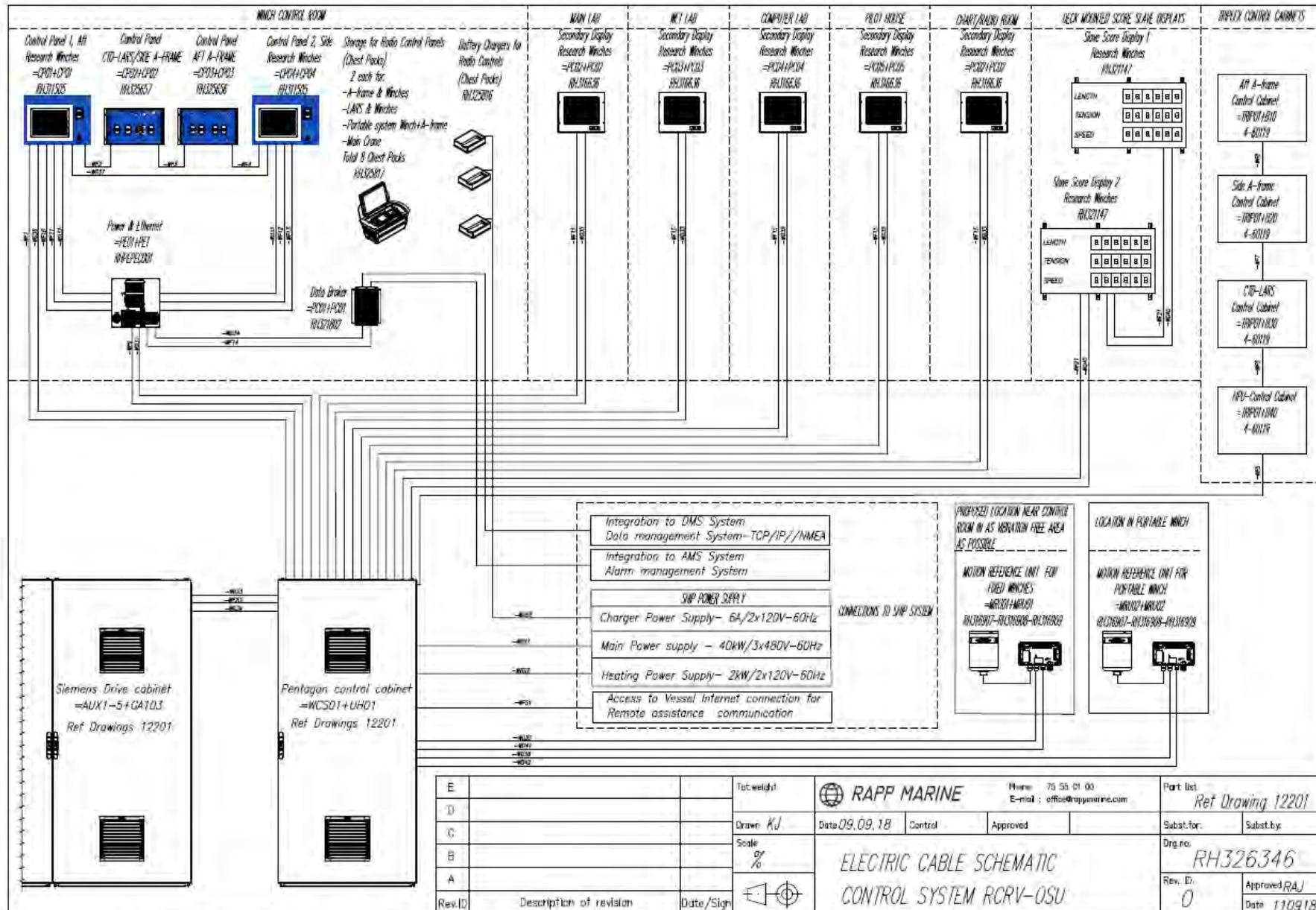


# Portable Crane

- Telescopic knuckle boom crane
- Extends to 26' 2" ft., folds in 10' 3" ft.
- Designed to handle 5,180 lbs. static load at 25 ft., 2,200 lbs. dynamic load at 25 ft.
- Designed for towing case, up to 1,000 lbs.
  - 45 degrees max inboard/outboard angle
  - 60 degree max tow angle aft
- Includes crane winch – rated for 9,500 at minimum reach
- Also can use tension members from portable winch (on main deck)
- UNOLS 2x2 bolting pattern on base, mounts on main deck and covered foredeck.

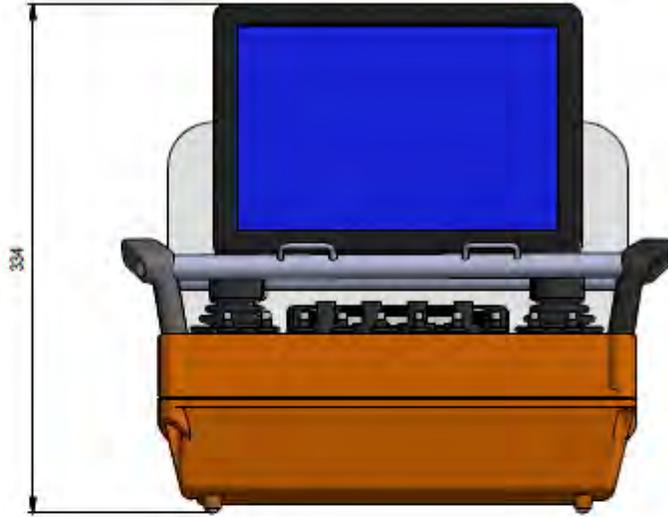


# Controls Systems & Strategy





# Controls Systems & Strategy



# Other OHS Supply Equipment

- Pullmaster Portable Tugger Winches
  - Two PL5 winches (4,500 lbs. pull) mounted on pedestals with UNOLS bolt pattern
- Sonardyne Portable Port Side Transducer Pole
  - Bolted foundation to be installed and removed when required
- Sheaves & Blocks
  - Multiple hanging blocks designed for all tension members to be used.

