October 16, 2019

Re: Transmittal Letter
RFP 982-19-4

Dear Selection Committee,

Golden Manufacturing appreciates the opportunity to submit this RFP Submission to the City of Riviera Beach for the supply of multiple boatlifts for their marina.

We have comprehensively reviewed the RFP package and understand fully the services that are to be provided and we are committed to perform the work within the time period set forth in the RFP.

Golden Manufacturing knows that we are best qualified to perform the work required for RFP-982-19-4. Golden has been in the boatlift business for over 35 years with a substantial amount of like kind multi-lift marinas projects completed. Provided in the RFP are past projects of like kind completed by Golden with a total of 248 lifts, 19 of which are 40K lifts. Golden has extensive experience with this type of application.

Golden Manufacturing hereby states that the proposal, provided in tab 4 of our RFP package, (Cost Proposal Sheet and Bid Schedule), in a separately sealed envelope, is a firm and irrevocable offer for sixty (60) days.

Golden Manufacturing's mission has been to design and produce the safest and most durable boatlift products in the world. Through our many years of experience, in house design team and staff of professionals we have been able to achieve just that. Golden offers the strongest support team to our clients with a no questions asked approach to providing solutions.

Our products are manufactured utilizing the highest marine grade materials. Our designs and options have continually set higher standards industry wide. Golden Manufacturing is also the only ISO 9001-2015 Certified company in the industry.

We thank you again for the potential opportunity and look forward to working with the City in the future.

Respectfully Submit,

William Golden, CEO

Golden Manufacturing, Inc.
17611 East Street
N. Fort Myers, Fl. 33917
Ph. (239) 337-4141 Fax:
www.goldenboatlifts.com

COMPANY PROFILE

Golden Manufacturing was formed in 1999 (30 yrs. Incorporated) in the State of Florida and is located in North Fort Myers. The company principal, William Golden, has been in the Boat Lift manufacturing business for over 35 years. Over the years Golden Manufacturing has been leading the way with new and innovative marine products. Many of these have received industry accolades and awards. Golden Manufacturing believes in supporting local communities and industry associations.

Present facility consists of approximately 40,000 sq. ft. of manufacturing floor space and administrative office. All engineering, drafting and manufacturing is done in house and does not utilize any subcontractors. The manufacturing processes are regulated under strict policies and procedures under ISO 9001:2015 guidelines. Golden is also committed to utilizing local labor and U.S.A manufactured materials and components.

At present, Golden Manufacturing has 75 staff members with responsibilities ranging from design, engineering, manufacturing, sales, administration, managerial, safety and quality assurance. All staff our vetted for their expertise and trained on a monthly basis in safety, new techniques, six sigma practices and ISO 9001:2015 guidelines and procedures.

Golden Manufacturing also has a network of over 300 distributors and clients throughout the world. The company prides itself on client attentiveness, accuracy and 100% satisfaction. This has been the cornerstone of our success and longevity.

Company Owner & Managers

Owner: William Golden
17611 East Street
Fort Myers, Florida 33917
239-337-4141 ext. 230
bgolden@goldenboatlifts.com

Vice President: Tim Murray
17611 East Street
Fort Myers, Florida 33917
239-337-4141 ext. 209
tmurray@goldenboatlifts.com

Vice President: Matthew Sloan
17611 East Street
Fort Myers, Florida 33917
239-337-4141 ext. 228

DIVISION OF CORPORATIONS

Department of State / Division of Corporations / Search Records / Detail By Document Number /

Detail by Entity Name

Florida Profit Corporation
GOLDEN MANUFACTURING, INC.

Filing Information

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Principal Address

17611 EAST STREET
NO. FORT MYERS, FL 33917

Changed: 03/28/2006

Mailing Address

17611 EAST STREET
NO. FORT MYERS, FL 33917

Changed: 03/28/2006

Registered Agent Name & Address

Aloia, Frank J., Jr.
2254 FIRST STREET
FORT MYERS, FL 33901

Name Changed: 04/06/2016

Address Changed: 04/06/2016

Officer/Director Detail

Name & Address

Title PST

GOLDEN, WILLIAM
17611 EAST STREET
NO FORT MYERS, FL 33917

Title VP

MURRAY, TIM
17611 EAST STREET
NORTH FORT MYERS, FL 33917

Title VP

SLOAN, MATTHEW
17611 EAST STREET
N. FORT MYERS, FL 33917

Annual Reports

Report Year	Filed Date
2017	03/30/2017
2018	01/16/2018
2019	02/18/2019

Document Images

02/18/2019 -- ANNUAL REPORT	View image in PDF format
05/10/2018 -- Amendment	View image in PDF format
01/16/2018 -- ANNUAL REPORT	View image in PDF format
03/30/2017 -- ANNUAL REPORT	View image in PDF format
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02/17/2002 -- ANNUAL REPORT	View image in PDF format
09/24/2001 -- Amended and Restated Articles	View image in PDF format
05/17/2001 -- Revocation of Dissolution	View image in PDF format
03/07/2001 -- Voluntary Dissolution	View image in PDF format
03/02/2001 -- ANNUAL REPORT	View image in PDF format
03/17/2000 -- ANNUAL REPORT	View image in PDF format
05/03/1999 -- Domestic Profit	View image in PDF format

Florida Department of State, Division of Corporations

END

Experience - Aluminum Cradle Boatlifts

The following are 4 multi-lift marina projects that are similar in size and scope as the proposed Riviera Beach Marina projects. Of the four marinas listed there are a total of 248 lifts with 19 being 40k lifts.

Project 1 Name:	Miami Beach Marina 300 Alton Road #8983 Miami Beach, Fl. 33139 305-673-6000
Project Manager:	John Hopwood 300 Alton Road #8983 Miami Beach, Fl. 33139 786-402-3821
Type and capacity: Quantity:	Golden Post Lifts / 28K & 40K (8 - 40K Lifts) 96 Lifts
Date lifts Installed:	Started 2009 - Ongoing
Contractor:	Miami Boatlifts 9250 SW 41st Street Miami, Florida 33165 305-207-9955
Key Professionals:	Ken Felty - Golden Boatlifts, V.P. of Sales 239- 337-4141 ext. 225
Site Conditions:	Extreme current with extreme wind and wake exposure
Project 2 Name:	River Cove Marina 2000 NW North River Drive Miami, Fl. 33125 305-545-5001
Project Manager:	Todd Zsamper 2000 NW North River Drive Miami, Fl. 33125 305-545-5001
Type and Capacity: Quantity:	Golden 4-Post Lifts / 16K - 40K (7 - 40K lifts) 68 Lifts
Date lifts Installed:	2014 - 2016
Contractor:	Miami Boatlifts 9250 SW 41st Street Miami, Florida 33165 305-207-9955
Key Professionals:	Ken Felty - Golden Boatlifts, V.P. of Sales 239- 337-4141 ext. 225
Site Conditions:	Moderate current with minimal wind and wake exposure

Project 3 Name:	Prime Marina Group - Monty's Coconut Grove 2550 South Bayshore Drive Miami, Fl. 33133 305-854-7997
Project Manager:	Enrique Quintero 2550 South Bayshore Drive Miami, Fl. 33133 305-986-0022
Type and Capacity: Quantity:	Golden 4-Post Lifts / 16K - 40K (4 - 40K lifts) 32 Lifts
Date lifts Installed:	2014 - 2016
Contractor:	Miami Boatlifts 9250 SW 41st Street Miami, Florida 33165 305-207-9955
Key Professionals:	Ken Felty - Golden Boatlifts, V.P. of Sales 239- 337-4141 ext. 225
Site Conditions:	Moderate current with wind and wake exposure
Project 4 Name:	Maximo Marina 4801 37th Street South St. Petersburg, Florida 33711 727-867-1102
Project Manager:	Chris Ahern - IGY Global 4801 37th Street South St. Petersburg, Florida 33711 727-867-1102
Type and Capacity: Quantity:	Golden 4-Post Lifts / 20K & 24K 52 Lifts
Date lifts Installed:	2017 - 2018
Contractor:	Orion Marine Construction Contact: AJ Perez 5440 W Tyson Avenue Tampa, Florida 333611 813-839-8441
Key Professionals:	Ken Felty - Golden Boatlifts, V.P. of Sales 239- 337-4141 ext. 225
Site Conditions:	Mild current with mild wind and no wake exposure

Professional Qualifications

Engineer of Record

J. L. (Jim) Sanders, P.E.
Structural & Construction Materials Engineer

Education
Bachelor of Industrial Engineering
Georgia Institute of Technology, 1969
Master of Business Administration Study
University of Houston, 1982

Summary of Qualifications
Over 30 years as an Industrial, Structural and Construction Materials Engineer and Manager with experience on numerous projects, utilizing skills and experiences in:

- Inspection, Investigation and Evaluation of Equipment & Building Construction
- Design, Inspection of Power Generation Systems
- Design, Inspection and Evaluation of Structures
- Design and Inspection of Concrete Restoration, Repairs & Waterproofing Systems
- Structural Inspection and Evaluation of Construction Distress
- Structural Design of Commercial and Residential Buildings
- Structural Design and Evaluation of Aluminum and Steel Boat Lifts, Walkways, Platforms and similar
- Concrete, Prestressed Concrete, Masonry, Steel, Aluminum, Wood and Wood Truss Construction
- Quality Assurance Inspection of New and Repair Construction

Project Experience
Airports
Boat Lifts, Walkways, Platforms and Ramps
Walkover Bridges
Condominium Complexes & Apartment Buildings
High Rise Buildings
Hospitals
Industrial Manufacturing Plants
Industrial Parks
Power Plants
Regional Shopping Centers
Residential Construction
Restaurants
Schools & Colleges
Water and Wastewater Treatment Plants

Experienced in design of aluminum structures in accordance with Aluminum Design Manual 2015
Boat Lift Design Experience from 1,000 to 120,000 Lb. Capacity
Boat Lift Specification Sheet and Drawing Preparation and Design Structural Calculations

Recent Projects:
Santa Clara Condo, Key West, FL - Building Structural Restoration at Select Areas
Sunrise @ Seaside Condominium, Key West, FL - Aluminum Shutters, Repairs & Waterproofing
Pelican Landing Condominium, Key West, FL - Concrete Structural Restoration
Tanger Outlet Mall, Fort Myers, FL - Inspections and Code Updates
Caribe Beach Resort, Fort Myers Beach, FL - Multi Building Restoration Projects
Golden Manufacturing - Boatlift Design/Engineering Evaluation
Golden Marine Systems – Walkways, Platforms, Ramps and Docks Design/Engineering Evaluation
Other Marine Equipment & System Manufacturers - Boatlift & Equipment Design/Engineering Evaluation

Experience Highlights
2017 - 2019 J.L. Sanders, P.E.
Monroe, GA
Consulting Engineer

2002 - 2017 Arnold/Sanders Consulting Engineers, Inc.
Fort Myers, FL
Principal and Senior Engineer

1969 - 2001: Various Engineering & Management Positions in Industry
GM, Singer, M. Lowenstein, John Deere, Crown & Pritchard Brown
FLORIDA BOARD OF PROFESSIONAL ENGINEERS (copy of License Attached)
Florida Professional Engineering Certification - Reg. #66361

Structural 1 Qualification
Advanced Building Code
PROFESSIONAL AFFILIATIONS (Current/Previous)
International Concrete Repair Institute
Concrete Reinforcing Steel Institute
International Code Council
National Society of Professional Engineers
Florida Engineering Society
Florida Structural Engineering Association

Contact Information:
Address: 2515 Gratis Road NW
Monroe, GA 30656
email: JLSandersPE@gmail.com
Phone: 678-661-3961
Mobile: 239-671-1578

Ron DeSantis, Governor

Halsey Beshears, Secretary

Florida dbpr

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

BOARD OF PROFESSIONAL ENGINEERS

THE PROFESSIONAL ENGINEER HEREIN IS LICENSED UNDER THE
PROVISIONS OF CHAPTER 471, FLORIDA STATUTES

SANDERS, J. L.

2515 GRATIS ROAD NW
MONROE GA 30656

LICENSE NUMBER: PE66361

EXPIRATION DATE: FEBRUARY 28, 2021

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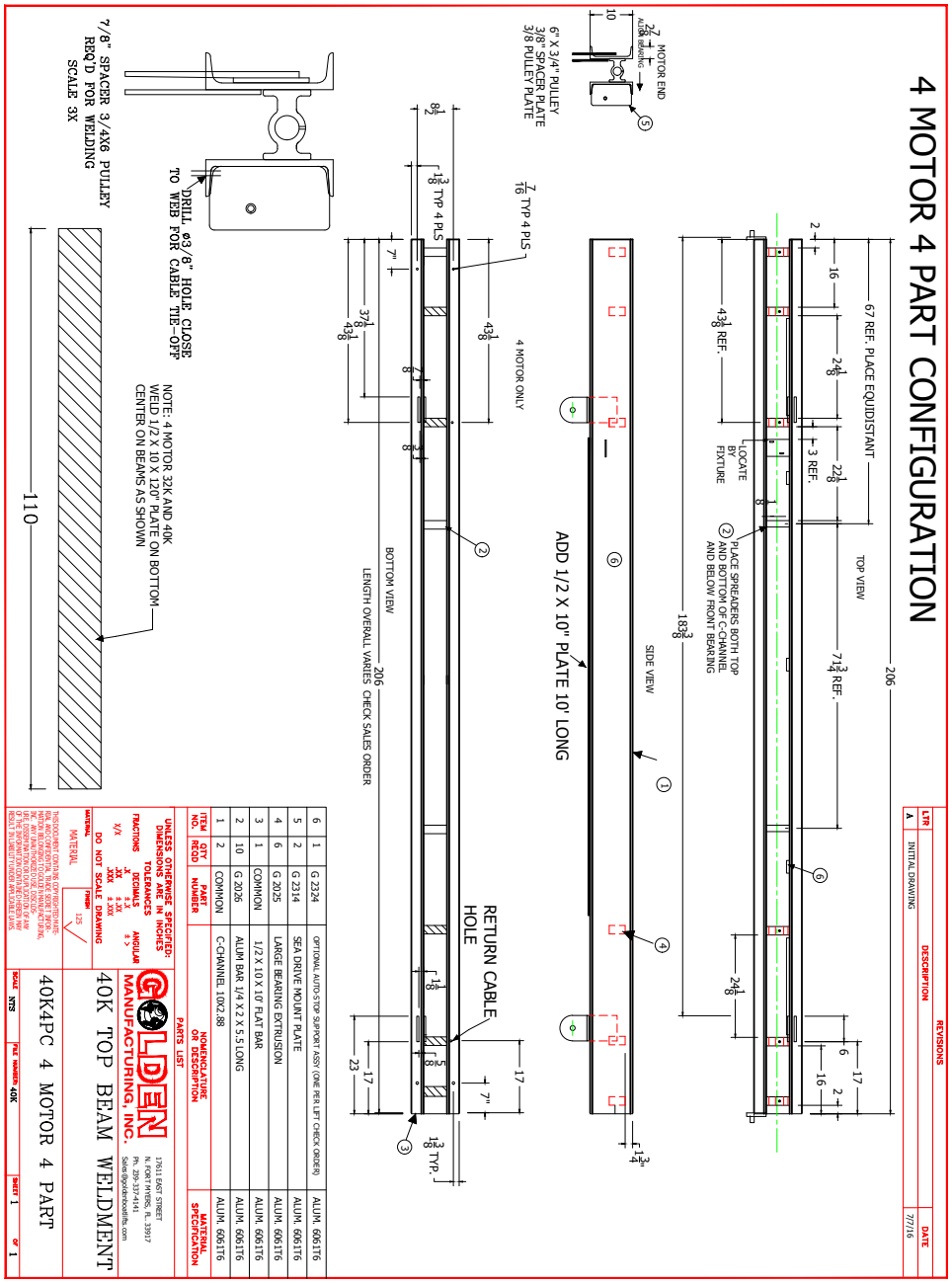
Jim Sanders P.E. License

40 K Boatlift Detailed Shop Drawings



40K boatlift calculations performed by Jim Sanders Florida P.E.

Client: Golden MFG,
17611 East Street
N. Ft. Myers, Florida 33917

STRUCTURAL CALCULATIONS FOR 4 POST BOAT LIFT

LIFTCAPACITY := 40kip

Material: 6061-T6 Aluminum

Loading: Boat is required to be placed on bunks with the center of gravity positioned equidistant to cradle beams. Boat shall not be stored on lifts during high wind events.

Codes: Florida Building Code, 2017
The Aluminum Association, Aluminum Design Manual 2015 (ADM)
American Forest and Paper Association (AF&PA) NDS 2012 for Wood Construction with Special Design Provisions for Wind and Seismic, 2008 Edition

Basic Design Wind Speed: 180 mph/139 mph (Ultimate/Nominal)
Risk Category: I
Exposure: D
Enclosure Classification: Open
Internal Pressure GCp: +0.00/-0.00

NOMENCLATURE

A = cross sectional area
b = width of a section or element
d = detail dimension for depth
E = compressive modulus of elasticity
F_b = allowable bending stress
F_b = allowable bending stress
F_{cy} = compressive yield strength
F_{su} = shear ultimate strength
F_{su} = shear ultimate strength
F_t = allowable tensile stress
F_{tu} = tensile ultimate strength
F_{ty} = tensile yield strength
I_x, I_y = moment of inertia about axis
L = unsupported length in the plane of bending
L_b = unbraced length for bending
M = bending moment applied to the member
P = applied concentrated load
r_y = radii of gyration
S_x = section modulus
λ_1, λ_2 = slenderness ratio
V = shear force
Δ = dimensional distance of deflection
Ω_u = tensile rupture safety factor
Ω_y = tensile yield safety factor
γ = density

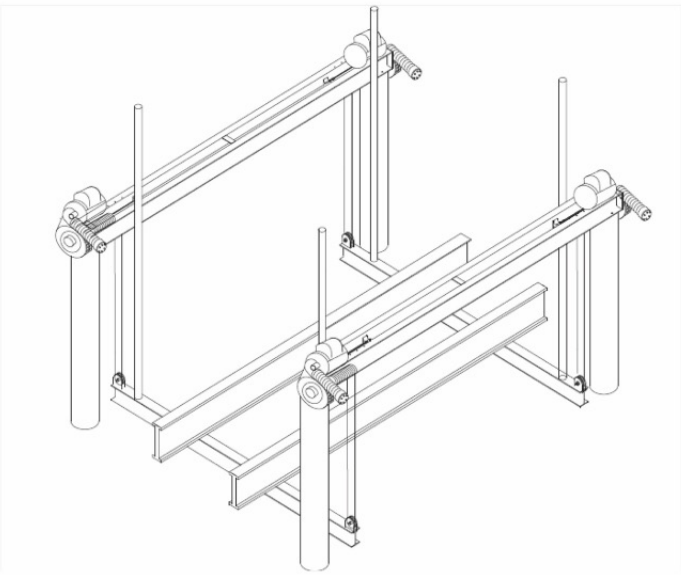


Fig. 1 - Typical Configuration of 4 Post Series Boat Lift

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MATERIALS AND PROPERTIES

Minimum Mechanical Properties of Unwelded 6061-T6 Aluminum Alloy:

$F_{tu} := 38ksi$ $F_{ty} := 35ksi$ $F_{cy} := 35ksi$ $F_{su} := 24ksi$ $E := 10100ksi$ $\gamma_{AL} := 0.100\frac{lb}{in^3}$

Minimum Mechanical Properties of Welded 6061-T6 Aluminum Alloy:

$F_{tuw} := 24ksi$ $F_{tyw} := 11ksi$ $F_{cyw} := 11ksi$ $F_{suw} := 15ksi$ $E_w := 10100ksi$

Weld Filler :

Weld Filler	Filler Minimum Strength	Weld Thickness (typical)
4043	$F_{wf} := 12.2ksi$	$S_{wtypical} := \frac{3}{8}in$

Cradle Beam: Shape Properties:

(2) I 10 x 10.3

$d_{cradle} := 10in$ $b_{cradle} := 6in$ $t_{fcradle} := 0.50in$ $t_{wcradle} := 0.29in$ $R_{cradle} := 0.4in$

$A_{cradle} := 8.75in^2$ $S_{xcradle} := 31.2in^3$ $I_{xcradle} := 156in^4$ $I_{ycradle} := 18.0in^4$ $r_{ycradle} := 1.44in$

$J_{cradle} := 0.620in^4$ $C_{wcradle} := 407in^6$

Composite Shape: (2) I 10 x 10.3

Composite Shape Properties:

$A_{2cradle} := (A_{cradle} \cdot 2)$ $A_{2cradle} = 17.5\,in^2$ $I_{x2cradle} := I_{xcradle} \cdot 2$ $I_{x2cradle} = 312\,in^4$

$b_{2cradle} := (b_{cradle} \cdot 2)$ $b_{2cradle} = 12\,in$

$d_{x2cradle} := 12in$ $d_{2cradle} := \frac{d_{x2cradle}}{2} + x_{x2cradle}$ $(d_{2cradle}) = 13\,in$

$r_{y2cradle} := \sqrt{\frac{(2I_{ycradle}) + 2(A_{cradle} \cdot d_{2cradle}^2)}{A_{2cradle}}}$ $r_{y2cradle} = 13.08\,in$

$S_{x2cradle} := S_{xcradle} \cdot 2$ $S_{x2cradle} = 62.4\,in^3$

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MATERIALS AND PROPERTIES (continued)

Cable Beam: Shape Properties:

C 10 x 8.64

$d_{cable} := 10in$ $b_{cable} := 2.886in$ $t_{fcable} := 0.526in$ $t_{wcable} := 0.437in$ $R_{cable} := 0.34in$

$A_{cable} := 7.35in^2$ $S_{xcable} := 18.2in^3$ $I_{xcable} := 91.2in^4$ $I_{ycable} := 3.36in^4$ $r_{ycable} := .68in$

Composite Shape: (2) C 10 x 8.64

Composite Shape Properties:

$A_{2cable} := (A_{cable} \cdot 2)$ $A_{2cable} = 14.7\,in^2$

$I_{x2cable} := I_{xcable} \cdot 2$ $I_{x2cable} = 182.4\,in^4$

$S_{x2cable} := 2 \cdot 18.2in^3$ $S_{x2cable} := 36.4in^3$

$d_{x2cable} := 3in$ $d_{2cable} := \frac{d_{x2cable}}{2} + x_{x2cable}$ $d_{2cable} = 2.72\,in$

$r_{y2cable} := \sqrt{\frac{(2I_{ycable}) + 2(A_{cable} \cdot d_{2cable}^2)}{A_{2cable}}}$ $r_{y2cable} = 2.8\,in$

Cable: Stainless Steel AISI Type 304 Strand Configuration: 7x19
Breaking Strength Data Provided by Cable Manufacturer : *Fortune Rope and Metal Co.Inc.*
67 Ballou Blvd. Bristol, RI 02809

Diameter := $\frac{3}{8}in$ Allowable Breaking Strength = $B_S := 12kip$

Cable Pulley Configuration is a 4 Part System = $Part := 4$

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LOADING

Dead Load: Aluminum Self Weight: (AL)

$V_{AL} := A_{cradle} \cdot 2 \cdot 18\,ft$ $\quad AL := V_{AL} \cdot \gamma_{AL}$

$V_{AL} = 3780\,in^3$ $\quad AL = 367\,lb$

Bunk Self Weight (WB)

Assume an aluminum section with carpet pad $\quad \gamma_{CPT} := 0.03\,\frac{lb}{in^3}$

$WB := 2 \cdot 25\,ft \cdot \left(A_{bunk} \cdot \gamma_{AL} + \gamma_{CPT} \cdot .5in \cdot 7.25in\right)$

$WB = 575\,lb$

Note: Factoring in additional weight of cable and other components

$DL := AL + WB + 300lb$ $\quad DL = 1241\,lb$

Live Load: $\quad LL = 40000\,lb$

SAFETY FACTORS

ADM Section D.1

For buildings and similar structures

$\left(\Omega_y := 1.65\right)$ $\left(\Omega_u := 1.95\right)$

CRADLE BEAM

Design Loading

Assumptions:
1. 25% of the total load is applied at the bunk locations as, P
2. Lateral bracing of the cradle beam is provided at the bunk board locations. The bunk boards are in turn braced by the boat hull. The bunk boards span continuously across both cradle beams and are attached to each cradle beam by angles (L3x3x3/16min). The angles are aligned vertically each side of the beam and attached outside the top andb bottom flanges with thru-bolts.

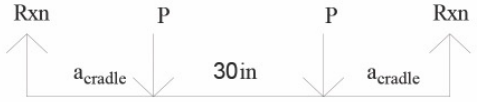

Fig. 2 - Cradle Beam Design Load Diagram

$P := \frac{DL + LL}{4}$ $\quad P = 10.31 \cdot kip$

Maximum bending moment, M

$M_{cradle} := P \cdot a_{cradle}$ $\quad M_{cradle} = 958.9\,in \cdot kip$

Maximum Reaction and Shear = P (kips)

$a_{cradle} := \frac{18\,ft - 30\,in}{2}$ $\quad a_{cradle} = 93\,in$

Total Length $\quad L := 18\,ft$

Unbraced Length $\quad L_b := a_{cradle}$ $\quad L_b = 93\,in$

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CRADLE BEAM

Allowable Tension Stress

ADM Chapter D (Design of Members for Tension)

$$\frac{F_{ty}}{\Omega_y} \quad \text{and} \quad \frac{F_{tu}}{\Omega_u}$$

Allowable Tension Stress

Unwelded (Allowable Stress)

$F_{tyunwelded} := 35\frac{ksi}{\Omega_y}$ $F_{tyunwelded} = 21.2 \cdot ksi$

$F_{tuunwelded} := 38\frac{ksi}{\Omega_u}$ $F_{tuunwelded} = 19.5 \cdot ksi$

Welded (Allowable Stress)

$$F_{tywelded} := \begin{cases} 11\frac{ksi}{\Omega_y} & \text{if } t_{fcradle} \geq \frac{3}{8}in \\ 15\frac{ksi}{\Omega_y} & \text{otherwise} \end{cases} \qquad F_{tywelded} = 6.7 \cdot ksi$$

$F_{tuwelded} := 24\frac{ksi}{\Omega_u}$ $F_{tuwelded} = 12.3 \cdot ksi$

-Assume cradle beam NET and GROSS sections are approximately equal: Use minimum YIELD/ULTIMATE stress
-There is no welding along the beam span on the tension side (bottom) flange.

$F_{tFcradle} := \min(F_{tyunwelded}, F_{tuunwelded})$ $F_{tFcradle} = 19.5 \cdot ksi$

Allowable Compressive Stress

ADM Chapter E (Design of Members for Compression)

-Assume cradle beam NET and GROSS sections are approximately equal: Use minimum YIELD/ULTIMATE stress
-There is no welding along the beam span on the compression side (top) flange.

$F_{cFcradle} := F_{cy}$ $F_{cFcradle} = 35 \cdot ksi$

Allowable Compressive Stress

ADM Section B.5.4.1 (Flat Elements Supported on One Edge)

ADM Table B.4.2 (Buckling Constants for Temper Designations beginning with T5, T6, T7, T8 or T9)

$$\left(B_p := F_{cFcradle} \cdot \left[1 + \frac{F_{cFcradle}^{\frac{1}{3}}}{11.4\left(ksi^{\frac{1}{3}}\right)} \right] \right) \qquad (B_p) = 45.04 \cdot ksi$$

$$\left(D_p := \frac{B_p}{10ksi} \cdot \sqrt{\frac{B_p}{E}} \right) \qquad (D_p) = 0.3$$

$$\left(C_p := 0.41\left(\frac{B_p}{D_p} \cdot \frac{1}{ksi} \right) \right) \qquad (C_p) = 61.39$$

ADM Table B.4.3 (Post Buckling Constants)

$(k_1 := 0.35)$ $(k_2 := 2.27)$

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CRADLE BEAM

Allowable Compressive Stress (continued)

Slenderness Lower Limit, λ_1 $\left(\lambda_1 := \frac{B_p - F_{cFcradle}}{5.0D_p}\right)$ $\left(\lambda_1\right) = 6.68 \cdot ksi$

Slenderness Upper Limit, λ_2 $\left(\lambda_2 := \frac{k_1 \cdot B_p}{5.0D_p}\right)$ $\left(\lambda_2\right) = 10.48 \cdot ksi$

$b := \frac{b_{cradle} - t_{wcradle}}{2} - R_{cradle}$ $\left(\lambda_{cradle} := \frac{b}{t_{fcradle}}\right)$ $\left(\lambda_{cradle}\right) = 4.91$

$$F_{c1cradle} := \begin{cases} \frac{F_{cFcradle}}{\Omega_y} & \text{if } \lambda_{cradle} \le 6.68 \\ \text{otherwise} \\ \quad \begin{cases} \frac{k_2\sqrt{B_p \cdot E}}{\Omega_y \cdot 5.0 \cdot \lambda_{cradle}} & \text{if } \lambda_{cradle} \ge 10.48 \\ \frac{B_p - (5.0 \cdot 0.3 \cdot 4.91)ksi}{\Omega_y} & \text{otherwise} \end{cases} \end{cases}$$

$\left(F_{c1cradle}\right) = 21.2 \cdot ksi$

Design of Members for Flexure

ADM Chapter F (F.4 - Design of Members for Lateral Torsional Buckling)

$\left(r_{ye} := \sqrt{\frac{\sqrt{I_{ycradle}}}{S_{xcradle}} \cdot \sqrt{C_{wcradle} + 0.038 \cdot J_{cradle} \cdot (L_b)^2}}\right)$ $\left(r_{ye}\right) = 1.83\,in$

$\left(\lambda := \frac{L_b}{r_{ye}}\right)$ $\left(\lambda\right) = 50.73$

ADM Table B.4.2 (Buckling Constants for Temper Designations beginning with T5, T6, T7, T8 or T9)

$\left(B_c := F_{cFcradle} \cdot \left(1 + \sqrt{\frac{F_{cFcradle}}{2250ksi}}\right)ksi\right)$ $\left(Bc := 39.36\right)$

$\left(D_c := \frac{Bc}{10ksi} \cdot \sqrt{\frac{B_c}{E}}\right)$ $D_c := .246$

$\left(C_c := 0.41\left(\frac{B_p}{D_p} \cdot \frac{1}{ksi}\right)\right)$ $\left(C_c\right) = 61.39$

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CRADLE BEAM

Design of Members for Flexure (continued)

ADM Chapter F (F.4 - Design of Members for Lateral Torsional Buckling)

$$F_{c2cradle} := \begin{cases} \dfrac{\pi^2 \cdot E \cdot \lambda \cdot S_{xcradle}^{\frac{1}{3}}}{C_c^{3}_{in}} & \text{if } \lambda < C_c \\ \dfrac{\pi^2 \cdot E \cdot S_{xcradle}^{\frac{1}{3}}}{\lambda^{2}_{in}} & \text{if } \lambda \geq C_c \text{ otherwise} \end{cases} \qquad \left(F_{c2cradle}\right) = 68.8 \cdot ksi$$

Cradle Beam Bending Stress Check

Allowable Bending Stress, F_b

$$\left(F_b := \min\left(F_{tFcradle}, F_{c1cradle}, F_{c2cradle}\right)\right) \qquad \left(F_b\right) = 19.5 \cdot ksi$$

Applied Flexural Stress, $\sigma_{bcradle}$

$$\sigma_{bcradle} := \frac{M_{cradle}}{S_{x2cradle}} \qquad \left(\sigma_{bcradle}\right) = 15.4 \cdot ksi$$

$$Check1 := \text{if}\left(\sigma_{bcradle} \leq F_b, \text{"Cradle Beam Flexure Okay"}, \text{"Cradle Beam Flexure No Good"}\right)$$

$$Check1 = \text{"Cradle Beam Flexure Okay"}$$

Allowable Shear Stress

ADM Section G2 (Members with Flat Webs Supported on Both Edges)

Design section of web is unwelded, Use ADM Table 2-19 for 6061-T6 Allowable Stress

Slenderness Ratio $\lambda_{cradle} := \dfrac{d_{cradle}}{t_{wcradle}}$ $\qquad \lambda_{cradle} = 34.48$

Slenderness Lower Limit, λ_1 $\qquad \lambda_1 := 36$

Slenderness Upper Limit, λ_2 $\qquad \lambda_2 := 64$

$$F_s := \begin{cases} 12.7 \cdot ksi & \text{if } \lambda_{cradle} \leq \lambda_1 \\ \dfrac{38665}{\lambda_{cradle}^{2}} \cdot ksi & \text{if } \lambda_{cradle} \geq \lambda_2 \\ \left[16.5 - 0.107 \cdot \left(\lambda_{cradle}\right)\right] \cdot ksi & \text{otherwise} \end{cases}$$

F_s = Allowable Shear Stress

$F_s = 12.7 \cdot ksi$

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CRADLE BEAM

Allowable Shear Stress (continued)

f_s = Shear Stress Due to Vertical Load

$$f_s := \frac{P}{d_{cradle} \cdot t_{wcradle}} \qquad f_s = 3.56 \cdot ksi$$

Check2 := if($f_s \le F_s$, "Cradle Beam Shear Okay" , "Cradle Beam Shear No Good")

Check2 = "Cradle Beam Shear Okay"

DEFLECTION

The total deflection at the centerline of the boat (i.e. betweeen bunks).

$$\Delta_{max} := \left(\frac{P \cdot a_{cradle}}{24 \cdot E \cdot I_{x2cradle}}\right) \cdot \left(3 \cdot L^2 - 4 \cdot a_{cradle}^2\right) \qquad \Delta_{max} = 1.34\,in$$

Assumed Deflection Limit of L over 120 $\qquad \Delta_{Limit} := \frac{L}{120} \qquad \Delta_{Limit} = 1.8\,in$

Check3 := if($\Delta_{max} \le \Delta_{Limit}$, "Deflection Okay" , "Deflection No Good")

Check3 = "Deflection Okay"

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CABLE BEAM

Assumptions:
1. The cable beam channels bear on top of the piles. Connections to the pile are required for lateral stability (i.e. secondary load effects) and to resist short-term lateral wind loading.
2. The pair of channels are aligned back-to-back at 3in gage. The channel webs are mechanically fastened together at points no more than 3ft on center along the entire span.

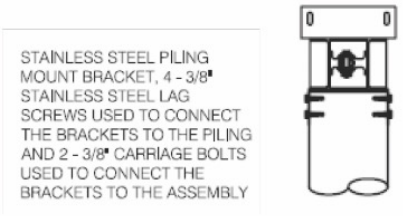

Fig. 3 - Cable Beam Cross Section at Pile Support

Design Loading

Load P is applied at the worst load condition, where the loaded cable on the winder is at the furthest point from the pile connection. This location is 15 inches from the pile.

Fig. 4 - Cable Beam Design Load Diagram

$P := \frac{DL + LL}{4}$ $P = 10.31 \cdot kip$

Max distance to cable tension $a_{cable} := 15in$

Total Length $L_{cable} := 17ft$

Unbraced Length for single channel $L_{u1cable} := \max\left(3ft, \frac{17ft - 2 \cdot a_{cable}}{2}\right)$ $L_{u1cable} = 87\ in$

Unbraced length for channel pair $L_{u2cable} := L_{cable} - 10ft$ $L_{u2cable} = 84\ in$

Maximum bending moment, M

$M_{cable} := P \cdot a_{cable}$ $M_{cable} = 154.7\ in \cdot kip$

Maximum Reaction and Shear = P (kips) $P = 10.31 \cdot kip$

Allowable Tension Stress

ADM Chapter D (Design of Members for Tension)

Unwelded (Allowable Stress)

$F_{tyunwelded} := 35\frac{ksi}{\Omega_y}$ $F_{tyunwelded} = 21.2 \cdot ksi$

$F_{tuunwelded} := 38\frac{ksi}{\Omega_u}$ $F_{tuunwelded} = 19.5 \cdot ksi$

Welded (Allowable Stress)

$F_{tywelded} := \begin{cases} 11\frac{ksi}{\Omega_y} & \text{if } t_{fcable} \geq \frac{3}{8}in \\ 15\frac{ksi}{\Omega_y} & \text{otherwise} \end{cases}$ $F_{tywelded} = 6.7 \cdot ksi$

$F_{tuwelded} := 24\frac{ksi}{\Omega_u}$ $F_{tuwelded} = 12.3 \cdot ksi$

-Assume cradle beam NET and GROSS sections are approximately equal: Use minimum YIELD/ULTIMATE stress
-There is no welding along the beam span on the tension side (bottom) flange.

$F_{tFcable} := \min(F_{tyunwelded}, F_{tuunwelded})$ $F_{tFcable} = 19.5 \cdot ksi$

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CABLE BEAM

Allowable Compressive Stress

ADM Chapter E (Design of Members for Compression)

Assume welds are near compression flange

$F_{cFcable} := F_{cyw}$ $\quad F_{cFcable} = 11 \cdot ksi$

Allowable Compressive Stress

ADM Section B.5.4.1 (Flat Elements Supported on One Edge)

ADM Table B.4.2 (Buckling Constants for Temper Designations beginning with T5, T6, T7, T8 or T9)

$$B_p := F_{cFcable} \cdot \left[1 + \frac{F_{cFcable}^{\frac{1}{3}}}{11.4\left(ksi^{\frac{1}{3}}\right)}\right] \qquad (B_p) = 13.15 \cdot ksi$$

$$D_p := \frac{B_p}{10ksi} \cdot \sqrt{\frac{B_p}{E}} \qquad (D_p) = 0.05$$

ADM Table B.4.3 (Post Buckling Constants)

$(k_1 := 0.35)$ $(k_2 := 2.27)$

Slenderness Lower Limit, λ_1 $\quad \lambda_{1cable} := \frac{B_p - F_{cFcable}}{5.0ksi \cdot D_p}$ $\quad (\lambda_{1cable}) = 9.05$

Slenderness Upper Limit, λ_2 $\quad \lambda_{2cable} := \frac{k_1 \cdot B_p}{5.0ksi \cdot D_p}$ $\quad (\lambda_{2cable}) = 19.4$

$$b := \frac{b_{cable} - t_{wcable}}{2} - R_{cable} \qquad (b) = 0.885\,in$$

$$\lambda_{cable} := \frac{b}{t_{fcable}} \qquad (\lambda_{cable}) = 1.68$$

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CABLE BEAM

Allowable Compressive Stress (continued)

ADM Section B.5.4.1 (Flat Elements Supported on One Edge)

$$F_{c2cable} := \begin{cases} \dfrac{F_{cFcable}}{\Omega_y} & \text{if } \lambda_{cable} \le \lambda_{1cable} \\ \text{otherwise} \\ \quad \begin{cases} \dfrac{k_2 \cdot \sqrt{B_p \cdot E}}{\Omega_y \cdot 5.0 \cdot \lambda_{cable}} & \text{if } \lambda_{cable} \ge \lambda_{2cable} \\ \dfrac{B_p - 5.0 \cdot D_p \cdot \lambda_{cable} \cdot (ksi)}{\Omega_y} & \text{otherwise} \end{cases} \end{cases}$$

$F_{c2cable} = 6.67\,ksi$

ADM Table B.4.2 (Buckling Constants for Temper Designations beginning with T5, T6, T7, T8 or T9)

$$B_{RA} := F_{cFcable} \cdot \left(1 + \sqrt[3]{\frac{F_{cFcable}}{1500 \cdot ksi}}\right)$$

$B_{RA} := 39.36$

$$D_{RA} := \frac{B_p}{10ksi} \cdot \sqrt{\frac{B_p}{E}}$$

$D_{RA} := .246$

$$C_{RA} := 0.41\left(\frac{B_p}{D_p}\right)$$

$C_p = 65.6$

Single Channel

Slenderness Ratio $\lambda_{11cable} := \dfrac{L_{u1cable}}{2r_{ycable}}$ $\left(\lambda_{11cable}\right) = 64$

$$F_{11cable} := \begin{cases} \dfrac{F_{cFcable}}{\Omega_y} & \text{if } \lambda_{11cable} \le \lambda_{1cable} \\ \text{otherwise} \\ \quad \begin{cases} \dfrac{k_2 \cdot \sqrt{B_p \cdot E}}{5.0 \cdot \lambda_{11cable}} & \text{if } \lambda_{11cable} \ge \lambda_{2cable} \\ B_p - 5.0 \cdot D_p \cdot \lambda_{11cable} & \text{otherwise} \end{cases} \end{cases}$$

$F_{11cable} := 4.47ksi$

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CABLE BEAM

Allowable Compressive Stress (continued)

ADM Section B.5.4.1 (Flat Elements Supported on One Edge)

Double Channel

Slenderness Ratio $\left(\lambda_{22cable} := \frac{L_{u2cable}}{r_{y2cable}}\right)$ $\left(\lambda_{22cable}\right) = 30$

$$F_{22cable} := \begin{cases} \frac{F_{cFcable}}{\Omega_y} & \text{if } \lambda_{22cable} \le \lambda_{1cable} \\ \text{otherwise} \\ \quad \begin{cases} \frac{k_2 \cdot \sqrt{B_p \cdot E}}{5.0 \cdot \lambda_{22cable}} & \text{if } \lambda_{22cable} \ge \lambda_{2cable} \\ B_p - 5.0 \cdot D_p \cdot \lambda_{22cable} & \text{otherwise} \end{cases} \end{cases}$$

$F_{22cable} := 9.54ksi$

Controlling gross section compressive stress

$\left(F_{c1cable} := \min\left(F_{cFcable}, F_{c2cable}, F_{11cable}, F_{22cable}\right)\right)$ $\left(F_{c1cable}\right) = \blacksquare \cdot 4.47ksi$

$\left(F_{c1cable}\right) := 4.47ksi$

Design of Members for Flexure

ADM Chapter F (F.4 - Design of Members for Lateral Torsional Buckling)

$\lambda_{3cable} := \frac{L_{cable}}{r_{y2cable}}$ $\lambda_{3cable} = 72.79$

ADM Table B.4.2 (Buckling Constants for Temper Designations beginning with T5, T6, T7, T8 or T9)

$\left(B_c := F_{cFcable} \cdot \left(1 + \sqrt{\frac{F_{cFcable}}{2250ksi}}\right)\right)$ $\left(B_c := 39.36\right)$

$\left(D_c := \frac{Bc}{10ksi} \cdot \sqrt{\frac{B_c}{E}}\right)$ $\left(D_c := .246\right)$

$C_c := 0.41\left(\frac{B_p}{D_p}\right)$ $\left(C_c\right) = 65.6$

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CABLE BEAM

Design of Members for Flexure (continued)

$$F_{c3cable} := \left(\begin{cases} \dfrac{\pi^2 \cdot E \cdot \lambda_{3cable} \cdot S_{xcradle}}{C_c^{\,3} \cdot in^3} & \text{if } \lambda_{3cable} < C_c \\ \dfrac{\pi^2 \cdot E \cdot S_{xcradle}}{\lambda_{3cable}^{\,2} \cdot in^3} & \text{if } \lambda_{3cable} \geq C_c \text{ otherwise} \end{cases} \right)$$

$F_{c3cable} = 587.1 \cdot ksi$

Cable Beam Bending Stress Check

Allowable Bending Stress, F_b

$F_b := \min(F_{tFcable}, F_{c1cable}, F_{c2cable}, F_{c3cable})$ $\quad F_b := 4.47ksi$

Applied Flexural Stress, σ_{bcable}

The design moment M_{cable} is equally distributed to the cable beam pair

$\left(\sigma_{bcable} := \dfrac{M_{cable}}{2S_{xcable}} \right)$ $\quad \left(\sigma_{bcable} \right) = 4.2 \cdot ksi$

Check4 := if($\sigma_{bcable} \leq F_b$, "Cable Beam Flexure Okay" , "Cable Beam Flexure No Good")

Check4 := "Cable Beam Flexure Okay"

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CABLE BEAM

Allowable Shear Stress

ADM Section G2 (Members with Flat Webs Supported on Both Edges)

Design section of web is unwelded, Use ADM Table 2-19 for 6061-T6 Allowable Stress

Slenderness Ratio $\left(\lambda_{cable} := \frac{d_{cable}}{t_{wcable}}\right)$ $\left(\lambda_{cable}\right) = 22.9$

Slenderness Lower Limit, λ_1 $\left(\lambda_1 := 36\right)$

Slenderness Upper Limit, λ_2 $\left(\lambda_2 := 64\right)$

$$\left(F_s := \begin{cases} 12.7 \cdot ksi & \text{if } \lambda_{cable} \le \lambda_1 \\ \frac{38665}{\lambda_{cable}^{2}} \cdot ksi & \text{if } \lambda_{cable} \ge \lambda_2 \\ \left[16.5 - 0.107 \cdot \left(\lambda_{cable}\right)\right] \cdot ksi & \text{otherwise} \end{cases}\right)$$

F_s = Allowable Shear Stress

$\left(F_s\right) = 12.7 \cdot ksi$

f_s = Shear Stress Due to Design Moment, M_{cable}

$\left(f_s := \frac{M_{cable}}{2 \cdot L_{cable} \cdot A_{cable}}\right)$ $\left(f_s\right) = 0.05 \cdot ksi$

Check5 := if$\left(f_s \le F_s, \text{"Cable Beam Shear Okay"}, \text{"Cable Beam Shear No Good"}\right)$

Check5 = "Cable Beam Shear Okay"

DEFLECTION

$\Delta_{max} := \left(\frac{P \cdot a_{cable}}{24 \cdot E \cdot I_{x2cable}}\right) \cdot \left(3 \cdot L^2 - 4 \cdot a_{cable}^{2}\right)$ $\Delta_{max} = 0.49\,in$

Assumed Deflection Limit of L over 120 $\Delta_{Limit} := \frac{L_{cable}}{120}$ $\Delta_{Limit} = 1.7\,in$

Check6 := if$\left(\Delta_{max} \le \Delta_{Limit}, \text{"Deflection Okay"}, \text{"Deflection No Good"}\right)$

Check6 = "Deflection Okay"

STAINLESS STEEL CABLE

$P = 10.3 \cdot kip$

$B_S = 12 \cdot kip$

Factor of Safety

$FS := \frac{Part \cdot B_S}{P}$ $FS = 4.66$

Check7 := if$\left(FS \ge 4, \text{"Cable Okay"}, \text{"Cable No Good"}\right)$

Check7 = "Cable Okay"

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LIFTING LUG PLATE AT PULLEY

Dimensional Requirements for Lug Plate

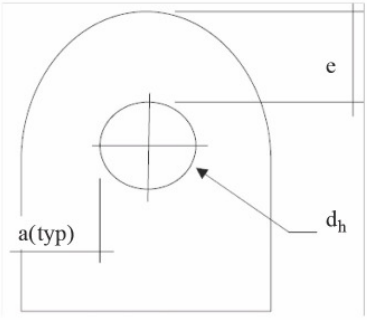

Fig. 5 - Typical Lug Plate

Diamter of Pulley Pin $d_p := 0.75\text{in}$

Diameter of hole $d_h := d_p + \left(\frac{1}{16}\right)\text{in}$ $d_h = 0.812\ \text{in}$

Clear end distance $e := 2d_h - \frac{d_h}{2}$ $e = 1.22\ \text{in}$ (min)

Thickness of plate $t := \left(\frac{3}{8}\right)\text{in}$

Clear edge distance $a := \min\left(\frac{d_h}{2}, 2t\right)$ $a = 0.41\ \text{in}$ (min)

Fillet weld size all around the base of lug plate $t_w := \left(\frac{3}{8}\right)\text{in}$

Allowable Pulley Bolt Shear

AISC Chapter J.3.5 (Tension and Shear Strength of Bolts and Threaded Parts)

From ASCE/SEI 8 Specification for the Design of Cold-Formed Stainless Steel Structural Members

Minimum nominal shear strength listed for type 304 bolt is $F_n := 31.5\text{ksi}$

Cross sectional area of bolt $A_b := d_p^2 \cdot \frac{\pi}{4}$ $A_b = 0.44\ \text{in}^2$

AISC Chapter J.3

$\Omega := 2.34$

$R_n := (F_n \cdot A_b)$ $R_n = 13.9 \cdot \text{kip}$

$\frac{R_n}{\Omega} = 5.9 \cdot \text{kip}$

Since there are two lug plates, one each side of the pully, the bolt is loaded in double shear.

Allowable shear capacity of the bolt in double shear = $R_{bolt} := 2\frac{R_n}{\Omega}$ $R_{bolt} = 11.9 \cdot \text{kip}$

$\text{Check8} := \text{if}\left(R_{bolt} > \frac{P}{2}, \text{"Pulley Bolt Okay"}, \text{"Pulley Bolt No Good"}\right)$

Check8 = "Pulley Bolt Okay"

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LIFTING LUG PLATE AT PULLEY

Allowable Bearing on Lug Plate Hole

ADM Section J.3.6 (Bolt Bearing)

$\Omega_{br} := 1.95$

$R_n := \left(\frac{d_h}{2} + e\right) \cdot t \cdot F_{tu}$ $\quad (R_n) = 23.16 \cdot kip$

Allowable bearing stress $\quad F_{br} := 2 \cdot \frac{F_{tu}}{\Omega_{br}}$ $\quad F_{br} = 39 \cdot ksi$

Bolt bearing area $\quad A_{br} := t \cdot d_p$ $\quad A_{br} = 0.28\,in^2$

Load to each plate is P/4

Allowbale Load for plate pair bearing,R $\quad R := F_{br} \cdot 2A_{br}$ $\quad R = 21.9 \cdot kip$

Check9 := if(P < R, "Bolt Bearing Okay" , "Bolt Bearing No Good")

Check9 = "Bolt Bearing Okay"

Block Shear Rupture Lug Plate

ADM Section J.7.3 (Block Shear Strength)

$A_{gv} := \left(e + \frac{d_h}{2}\right) \cdot t$ $\quad A_{gv} = 0.61\,in^2$

$A_{gt} := t \cdot (2 \cdot a + d_h)$ $\quad A_{gt} = 0.61\,in^2$

$A_{nv} := e \cdot t$ $\quad A_{nv} = 0.46\,in^2$

$A_{nt} := 2 \cdot t \cdot a$ $\quad A_{nt} = 0.3\,in^2$

$$P_{sr1} := \frac{\frac{F_{ty}}{\sqrt{3}} \cdot A_{gv} + F_{ty} \cdot A_{gt}}{\Omega_u} \qquad P_{sr1} = 17.3 \cdot kip$$

$$P_{sr2} := \frac{F_{su} \cdot A_{nv} + F_{ty} \cdot A_{gt}}{\Omega_u} \qquad P_{sr2} = 16.6 \cdot kip$$

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LIFTING LUG PLATE AT PULLEY

Weld at Lug Plate

Allowable Weld Shear

$T_{Allowable} := \frac{F_{sw} \cdot L_{we}}{n_u}$

Where: $L_{we} := 2 \cdot (2 \cdot a + d_h)$ $L_{we} = 3.25\,in$

Fsw is the least of : $F_{sw1}, F_{sw2}, F_{sw3}$

Weld root size at Lug Plate: $S_{wtypical} := 0.500\,in$

weld root shear	$F_{sw1} := \frac{\sqrt{2}}{2} S_{wtypical} \cdot F_{wf}$	$(F_{sw1}) = 4.31\,in^{-1} \cdot kip$
base material shear	$(F_{sw2} := S_{wtypical} \cdot F_{suw})$	$(F_{sw2}) = 7.5\,in^{-1} \cdot kip$
base material tension	$(F_{sw3} := S_{wtypical} \cdot F_{tuw})$	$(F_{sw3}) = 12\,in^{-1} \cdot kip$
$(F_{sw} := \min(F_{sw1}, F_{sw2}, F_{sw3}))$	$(\min(F_{sw1}, F_{sw2}, F_{sw3})) = 4\,in^{-1} \cdot kip$	$(F_{sw}) = 4.31\,in^{-1} \cdot kip$

Therefore, for a pair of plates: $T_{Allowable} := 2\left(\frac{F_{sw} \cdot L_{we}}{\Omega_u}\right)$ $T_{Allowable} = 14.4 \cdot kip$

Lifting Capacity of Lug Plate

$Check10 := if\left(\frac{P}{2} < \min(R_{bolt}, R, P_{sr1}, P_{sr2}, T_{Allowable}), \text{"Lug Plate Capacity Okay"}, \text{"Lug Plate No Good"}\right)$

Check10 = "Lug Plate Capacity Okay"

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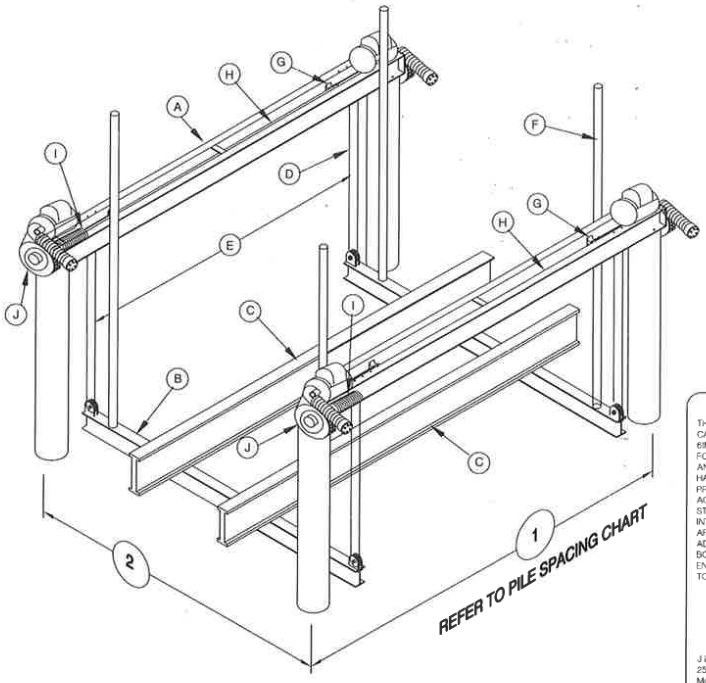
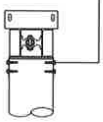
GOLDEN ENGINEERED 4 POST, 4 MOTOR SEA DRIVE BOAT LIFTS



STAINLESS STEEL PILING MOUNT BRACKET- RECOMMENDED ATTACHMENT BASED ON BRACKET CONFIGURATION. VERIFY ADEQUACY BASED ON ACTUAL SITE CONDITIONS:
4-3/8" STAINLESS STEEL LAG SCREWS USED TO CONNECT THE BRACKETS TO THE PILING AND
2-3/8" STAINLESS STEEL CARRIAGE BOLTS USED TO CONNECT THE BRACKETS TO THE LIFT CHANNELS



PILE SPACING CHART
The boat center of gravity needs to be set in the center of the top beam

Lift Capacity	"1" Dimension	"2" Dimension	Recommended Pile Diameters
Lb.	Ft.	Ft.	In.
32,000	16	16	12
40,000	16	18	12
56,000	18	20	12

STRUCTURAL ENGINEERING REVIEW

THIS CONSTRUCTION HAS BEEN DESIGNED AS A MAIN WIND FORCE RESISTING SYSTEM, WITH CALCULATED GRAVITY AND WIND LOADS IN COMPLIANCE WITH THE FLORIDA BUILDING CODE, 6th EDITION, 2017, CHAPTERS 16 & 20, ADM 2015, AND ASCE/SEI 7-10 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES" TO WITHSTAND THE WIND LOADS ASSOCIATED WITH AN ULTIMATE WIND SPEED OF 180 MPH, EXPOSURE "D", RISK CATEGORY I. J.L. SANDERS, P.E. HAS NO CONTROL OF THE MANUFACTURING, PERFORMANCE, OR INSTALLATION OF THIS PRODUCT. THESE GENERIC SPECIFICATIONS WERE ENGINEERED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICES BASED ON DATA PROVIDED BY THE MANUFACTURER. THIS STRUCTURAL REVIEW IS LIMITED TO THE PRIMARY FRAMING AND CONNECTIONS AND IS NOT INTENDED TO COVER MECHANICAL AND ELECTRICAL COMPONENTS. THESE SPECIFICATIONS ARE BASED ON STRUCTURAL CALCULATIONS TITLED "4 POST SEA DRIVE LIFT", WHICH CONTAIN ADDITIONAL DESIGN REQUIREMENTS AND CRITERIA AND ARE AVAILABLE UPON REQUEST. THE BOAT LIFTS DEPICTED IN THESE SPECIFICATIONS AND RELATED CALCULATIONS WERE ENGINEERED AS MANUFACTURED PRODUCTS FOR NON-SITE SPECIFIC USE AND NOT INTENDED TO COVER SITE SPECIFIC CONDITIONS.

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J.L. Sanders 12-17-18

J.L. SANDERS, P.E. Date
Reg. Florida No. 66361

SIGNATURE NOT VALID WITHOUT RAISED SEAL

NOTE: THIS STRUCTURE HAS BEEN DESIGNED FOR LOADS ASSOCIATED WITH AN ULTIMATE WIND SPEED OF 180 MPH,EXPOSURE "D", RISK CATEGORY I, CALCULATED PER FLORIDA BUILDING CODE 2017, ASCE/SEI 7-10 AND ADM-2015. BOATS SHALL NOT BE STORED ON LIFTS DURING HIGH WIND EVENTS.

IN GENERAL, PILING PENETRATION TO BE A MINIMUM OF 10' INTO THE SAND BOTTOM OR 5' INTO THE ROCK STRATA. SUB-SURFACE CONDITIONS CAN VARY GREATLY, THE CONTRACTOR SHALL VERIFY ALL PILE CAPACITIES. ALL PILINGS TO BE 2.5 C.C.A. PRESSURE TREATED WOOD. ALL STRUCTURAL MEMBERS TO BE 6061-T6 ALUMINUM.

SUMMARY OF DESIGN FEATURES

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)		
LIFT CAPACITY	TOP BEAM CHANNEL 2 EACH	CRADLE I-BEAM 2 EACH	BUNK BOARDS (AL)	CABLE SIZE	CABLE SPREAD	GUIDE POST HEIGHT	BEARINGS	DRIVE SHAFT	WINDER DIA	MOTOR HP VOLTAGE	INCHES OF LIFT PER MIN	RECOM PILING SIZES
Lbs	INCHES	INCHES		INCHES	IN	IN						
32,000#	C10 x 8.64 LB/FT 10 H x .526 2.88 W x .437 x 204 OAL	2 Double 10 H x .25 6 W x .41 192" Long	10" x 6" x .25 ALUM CARPETED	4- 5/16" x60' ST ST 4 PART	174"	120"	10 - 2" H.D. EXTRUDED 6061-T6 ALUM.	1-15/16" DIA. SCH 80 GALV PIPE	3-1/2" DIA SCH 80 ALUM PIPE W/ CABLE GROOVES	4 - 1 HP 120V/20A 240V/10A	9.90"	12" DIA
40,000#	C10 x 8.64 LB/FT 10 H x .526 2.88 W x .437 x 204 OAL	2 Double 10 H x .29 6 W x .50 216" Long		4- 3/8" x60' ST ST 4 PART	174"	120"	10 - 2" H.D. EXTRUDED 6061-T6 ALUM.			4 - 1 HP 120V/20A 240V/10A	9.90"	12" DIA
56,000#	C10 x 8.64 LB/FT 10 H x .526 2.88 W x .437 x 228 OAL	2 Double 12 H x .31 7 W x .62 240" Long		4- 7/16" x60' ST ST 4 PART	198"	120"	10 - 2" H.D. EXTRUDED 6061-T6 ALUM.			4 - 1-1/2 HP 120V/20A 240V/10A	9.90"	12" DIA

Golden Professional Support Staff

William Golden - Owner
239-337-4141 ext. 230
bgolden@goldenboatlifts.com

Bill Golden is a hands-on owner and is intimately involved in each and every project. Bill and the team collectively lend their expertise to every detail on each project. Bill's approach is 100% customer satisfaction - no questions asked. This approach and the golden reputation it produced has been the cornerstone of Golden Manufacturing 30+ years of success.

Ken Felty - V.P. Sales
239-337-4141 ext. 225
kfelty@goldenboatlifts.com

Ken is a 30-year veteran in the boatlift business in South Florida. Ken brings a wealth of knowledge and experience in understanding the absolute design, structure, installation and function of the Golden Boatlifts. Ken oversees the sales team who service 300+ dealers worldwide. Ken will be designated as the primary contact for the City of Riviera Beach project.

Devin Garrison - Plant Manager
239-337-4141 ext. 216
dgarrison@goldenboatlifts.com

Devin has been with Golden Manufacturing for 10-years and has worked his way up the ranks to now oversee all plant operations and deliveries. Through his 10-years Devin has learned, hands-on, every detail in the manufacturing of the Golden Boatlifts. Through his knowledge Devin has, over the years, assisted in continually improving and streamlining manufacturing procedures and processes. Devin will also be very involved in the City of Riviera Beach project.

Debra Johnson - Accounting Manager
239-337-4141 ext. 200
Accounting2@goldenboatlifts.com

Debra has been with Golden Boatlift for 7 years and oversees Golden Manufacturing's accounting department. Debra will be the main contact for all invoicing matters.

Albert Franzen - Draftsmen
239-337-4141 ext. 241
afranzen@goldenboatlifts.com

Albert has been with Golden Manufacturing for 3 years and is proficient in AutoCAD and Solidworks design software's. Albert is instrumental in designing new and innovative products, project shop drawings and marina layouts. Albert has 10+ years' experience in AutoCad and design work.

Technical Characteristics

General Product Information

All Golden Lifts are welded for structural integrity while bolting is limited to components requiring adjustments.

FEATURES

- 6061 aluminum structure.
- All non-adjustable parts are welded.
- Pre-wound and assembled beams.
- Pre-assembled cradle beams.
- Pulleys with grease fittings.
- Available with Flat Plate or Golden Sea-Drives®.
- Motors are painted or stainless steel.
- Grooved aluminum cable winders.
- All hardware and cables are 300 series stainless steel.

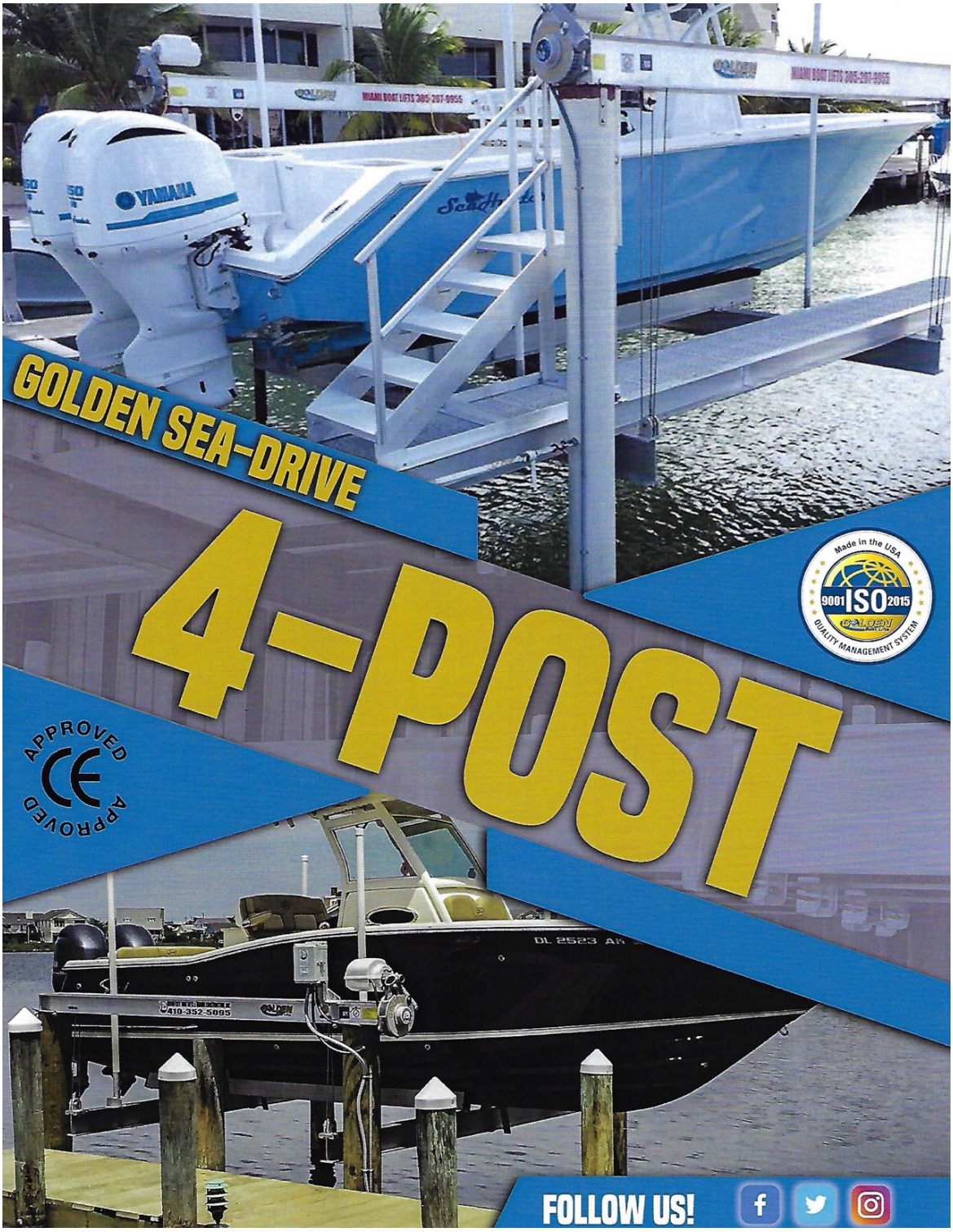
All Lifts are engineered to withstand harsh saltwater conditions using 6061 T6 marine grade aluminum, hardware and cables are high quality 300 series stainless steel.

Brochure - Provided in side pocket

For Flash Drive Click on Hyper Link below to view

http://www.goldenboatlifts.com/download-brochure/

4-Post Lift Flyer



To learn more about the Four Post Lift, call our team of experts at 239-337-4141 or visit us on the web www.goldenboatlifts.com

GOLDEN Boat Lifts

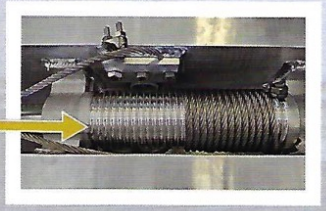
POWERED BY THE GOLDEN SEA-DRIVE

8,000 In-Lbs of Torque at .98 hp Input

PATENT # 7,850,147

5/8" Oversized hardened Drive Bolt Beneath Protective Cap

Stainless Steel Piling Double Mount Brackets with Insulator Pad

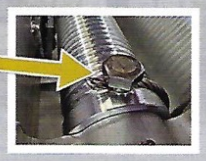


3.5 Inch Diameter Grooved Cable Winder vs 2.75 Inch

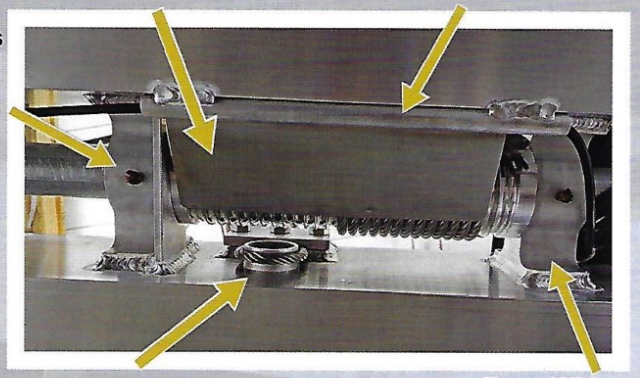
Stainless Cable Keeper

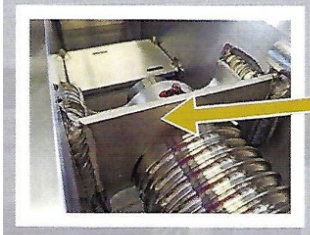
Welded Tube for Auto-Stop Wire to Prevent Wrapping on Winder

Cable Tie Off Bolt
PATENT # 6,719,241



Stainless Steel Grease Fittings





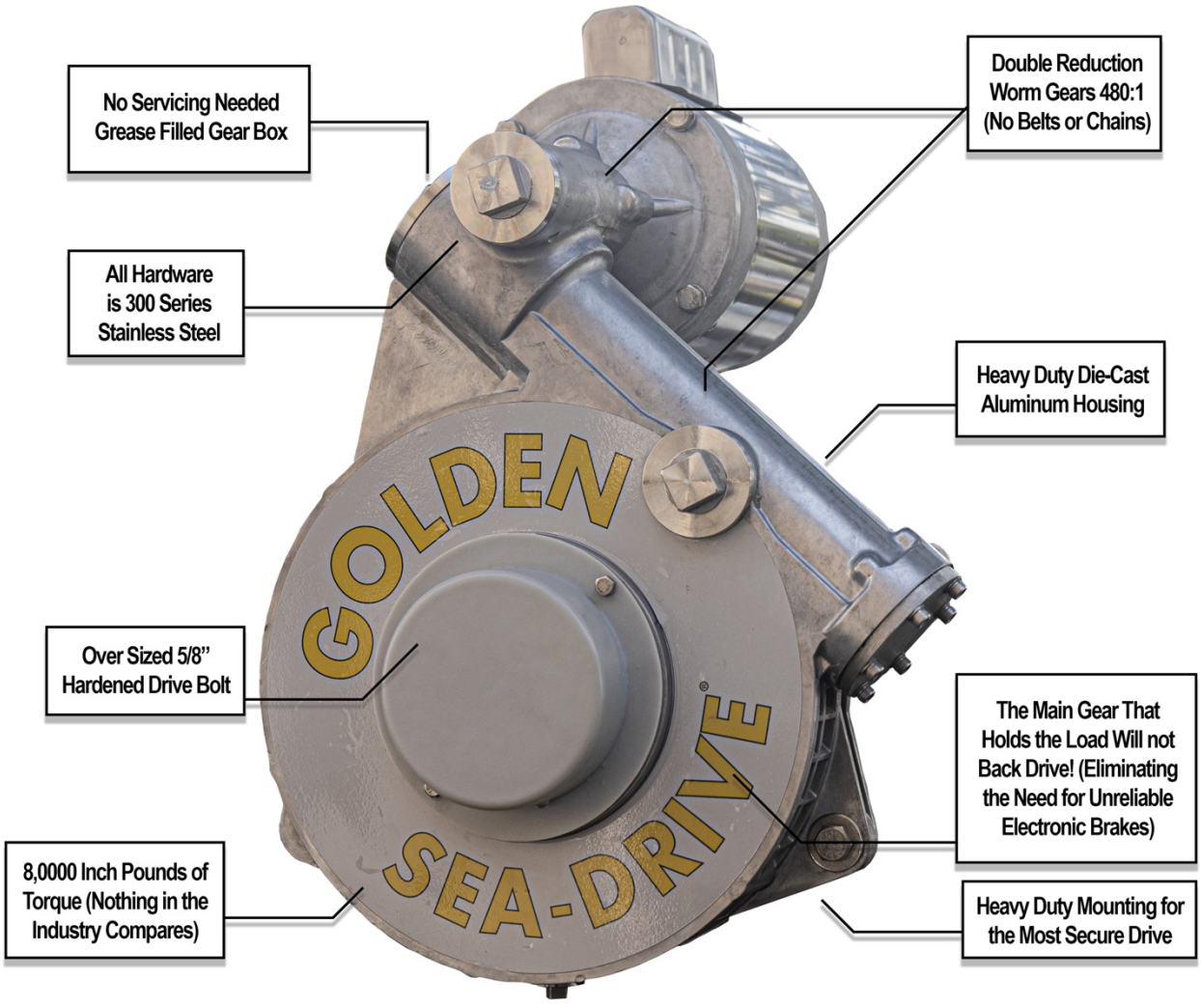
Cable Stop (Winder Cable Guard)
PATENT # 10,189,685

Welded Cable Adjuster (10,12,14,16 CD/SS Lifts)

Extra Wide Super Bearings

- 15 year warranty on the structural parts and 2 year on all other parts
- All non-adjustable parts are welded with 6061 aluminum structure
- All lifts are covered by Products Liability Insurance
- Capacities range from 5,000 lbs to 250,000 lbs
- All hardware and cables are 300 series Stainless Steel

Golden Sea Drive Unit



Photos of Similar Projects

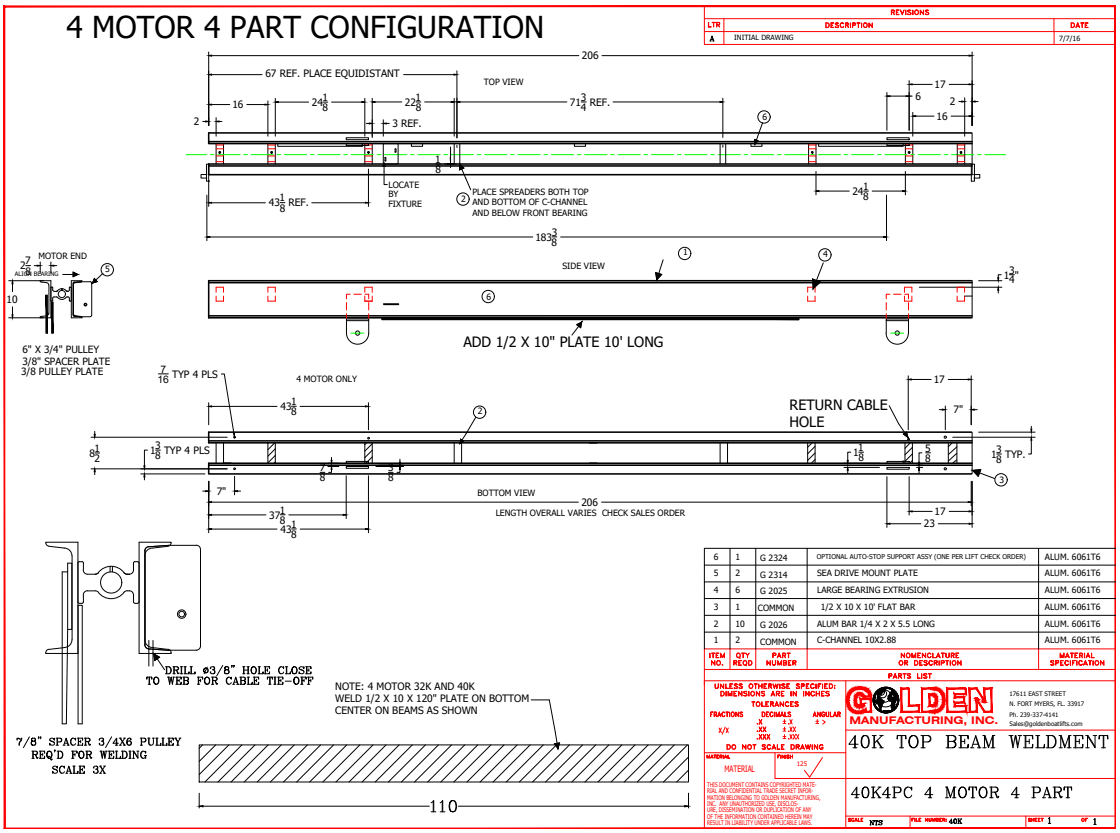
Miami Beach Marina, Miami Beach Florida

River Cove Marina, Miami Florida

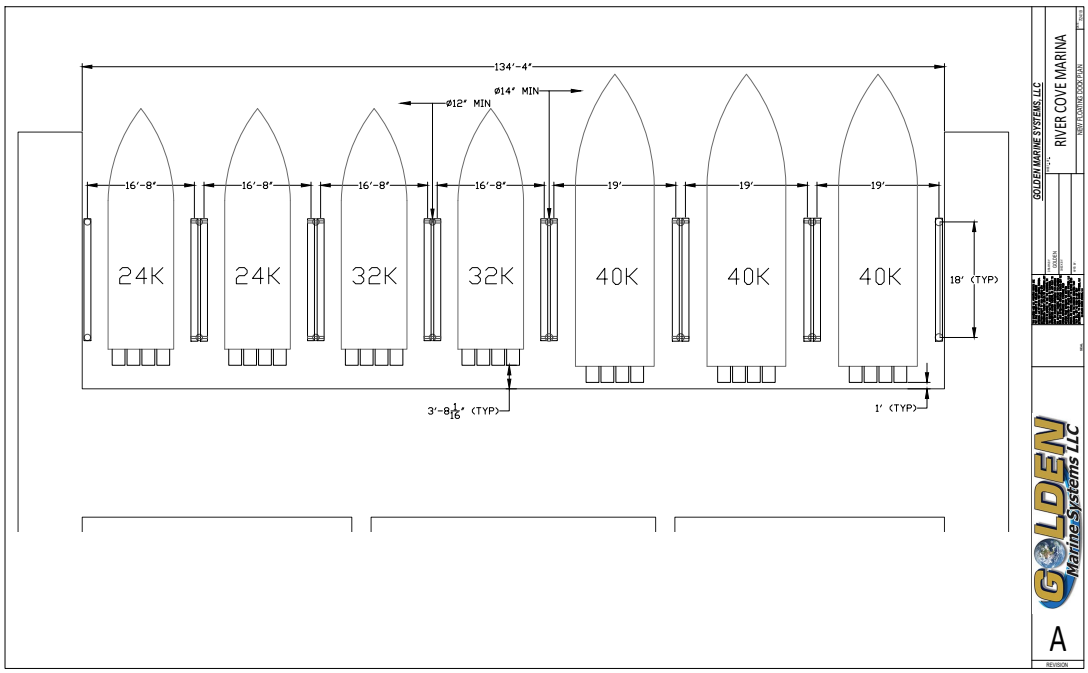
Prime Marine Group - Coconut Grove

Maximo Marina, St. Petersburg Florida

Sample Shop Drawing



Sample Layout Drawing



***Sample Calculations Provided in Professional (P.E.) Qualifications Sections**

Unique System Characteristics

Golden Boatlifts are designed and engineered utilizing patented technologies that exceed and set higher standards industry wide. Our boatlifts are designed to be easily installed and require virtually no maintenance.

Golden Boatlifts offers five main unique features that are not available from any other boatlift manufacturer. They are as follows:

- Our Sea-Drive gear box is grease packed and sealed which results in zero maintenance and no leaks.
- Our Sea Drives offer 8,000-inch lbs. of torque with a 480:1 double worm gear reduction.
- Golden offers exclusive engineering to support a 40K boatlift on 4-piles.
- Our standard warranty exceeds all other manufacturers.
- 3.5” Diameter deep groove winder versus 2.37” industry standard
- We are ISO 9001-2015 certified.

Below is a list of standard features that result in easy installation, operation and maintenance:

Installation:

- Pre wound and assembled top beams
- Pre-assembled cradle beams
- Pile Straps pre-installed
- Bunk Brackets and guideposts mounted to cradles

Operation:

- Remote control for easy operation
- Auto stop - sets highest and lowest points cradle can travel
- Cable keepers - prohibits cable from jumping winder grooves or unwinding

Maintenance:

- Zero Maintenance on gearbox - sealed grease packed
- Easy accessible grease fitting on all pulleys

Long Life Span:

- 6061-T6 marine grade aluminum structure
- 300 Series stainless steel cables and hardware
- Drive shafts between channels which limits exposure to the elements, allows for cleaner aesthetics and greater structural integrity

Manufacturers Schedule

Upon notice of award Golden Manufacturing can produce shop drawings, calculations and a layout within the time period of 2 weeks for review, comment or approval by the City of Riviera Beach. All technical shop drawings and calculations are available immediately to be conveyed to the City. A layout and installation drawing specific to the site will only need to be produced.

Golden manufacturing has both in-house draftsman and professional engineers available to easily accomplish the abovementioned tasks.

The manufacturing process and timeline for the 6 requested boatlifts is circa 30 days. This is a conservative timeline.

With our resources of 75+ professionally trained staff and plant managers we are certain that we can meet the City of Riviera Beach's required timeline of within 6 months as recited in RFP-982-19-2 Article 2 - Qualifications of the Manufacturer. Golden Manufacturing is certain that the timeline to complete all drawings, layouts and produce and deliver the 6 lifts can be within 3 months maximum.

Summary of Manufacturing Schedule from receipt of City purchase order:

Prepare Shop Drawings:	Complete
Prepare Lift Calculations:	Complete
Layout and Install Drawings:	2 - weeks
Review and Approval by City:	2-weeks (estimated)
Fabrication (6 lifts):	30 days
Delivery:	1 Day

Golden Warranty Statement

GOLDEN BOAT LIFTS® WARRANTY

1. THIS WARRANTY COVERS:

A. Boat Lifts purchased or used for personal, family, or household purposes, Golden Manufacturing Inc. (the "company"), warrants the structural integrity of the aluminum cradle beams and top beams of our 4 & 8 post boat lifts for a period of 15 years (excluding the Runabout series), elevator and PWC lifts 5 year warranty (excluding the EC Elevator series) from date of delivery by seller to the original purchaser of the property where the lift was installed as set forth in the order form. All lifts equipped with our 12 Volt DC solar powered package have a 1 year warranty on all solar components from date of purchase.

B. The company further expressly warrants that lifts purchased for personal, family, or household purposes shall be free from any manufacturer´s defects in material or workmanship for a period of 2 years. The Sea-Drive has a 10 year limited warranty, and the Hefty Hoist Flat Plate has a 5 year limited warranty, provided Annual Service is performed and records are kept by a trained Golden Boat Lift service technician. Our underwater tracks and hardware are warranted for 1 year from defects in material and/or workmanship. On the Golden Boat Lifts Gatorvator's, Elevators, and Single track lifts with tracks in the water require *Sacrificial anodes be maintained, and an electrical disconnect, including neutral and ground be installed and disconnected when the boat lift is not in use. Or a galvanic isolator properly connected between the electric source and boat lift on the grounding wire. If not the warranty will be null and void. Under no circumstances will the warranty coverage extend to damage caused by electrolysis.

C. The runabout series will be warranted for a one year period from the date of delivery by seller to the original purchaser this includes the electric motor and controls. The runabout series has a 5 year structural warranty. The EC line of Elevators will be warranted for a one year period from the date of delivery by the seller to the original purchaser this includes the electric motor and controls. The Structure will be warranted for a period of 2 years. The Underwater tracks will be warranted for a period of one year. Under no circumstances will the warranty coverage extend to damage caused by electrolysis .

D. The kayak Launch will be warranted from factory defects for a one-year period from the date of purchase by seller to the original purchaser. Under NO CIRCUMSTANCES will the warranty coverage extend to damage caused by improper installation or use.

2. WHAT IS NOT COVERED BY THIS WARRANTY:

A. The company makes no implied warranties with respect to lifts purchased for commercial purposes.

B. All repairs after the applicable warranty period are the Owner's responsibility.

C. Damage that is not the company's fault such as but not limited to: damage caused by accidents, hurricanes, tropical storms, high winds, high water or tides, any acts of God, misuse, over loading, negligence, alteration, modification or abusive operation, is NOT covered by this limited warranty.

D. Damage which is caused by improper product selection, improper installation, failure to follow applicable installation and maintenance recommendations, or failure to follow applicable instructions or warnings is not covered by this limited warranty.

C. The product may require periodic maintenance, which is not covered by warranty. While the seller may be equipped to handle your service needs, periodic maintenance may be performed by anyone qualified to do so.

D. A reasonable time for repairs must be allowed.

8. IF YOU HAVE QUESTIONS OR PROBLEMS:

A. Should the Owner encounter a problem, which might be, recovered by this limited warranty, the Owner must contact the Company in writing within the applicable warranty period. The company's address for receipt of notice is: Golden Manufacturing, Inc., 17611 East Street, North Fort Myers, Florida, 33917.

B. The owner should provide the following information in its written notice: The type of product purchased, the purchase date, serial number, event dates, dealer names, the problem or question, and any other comments.

C. This warranty gives you specific rights and you may also have other rights, which vary from state to state.

E. All routine maintenance and periodic service is the Owner's responsibility and is not covered by this limited warranty.

F. Boat lifts that were overloaded or weight was not centered, causing structural, gear or cable failure will not be covered by the Limited Warranty

3. WARRANTY DISCLAIMERS:

A. With respect to product purchased or used for commercial purposes, the company makes no express warranties or implied warranty of merchantability or fitness for any particular purpose.

B. Any applicable implied warranty, including any applicable warranty of merchantability or fitness for a particular purposed, is limited in duration to 2 years from the date of delivery from the seller.

C. The company makes no express warranties regarding its products except as stated herein. No agent, employee, or representative of the company has authority to bind the company to an affirmation, representation, or warranty concerning the company's products except as stated herein.

4. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

5. WARRANTY LIMITATIONS:

A. The Owner's remedies under thus limited warranty are limited exclusively to repair or replacement of components, which fail due to manufacturer's defects in materials or workmanship during normal operations.

B. The Company shall not be responsible for incidental or consequential damages, included, but not limited to, damages to property, loss of use, lost profits, or expenses for inconvenience.

C. Some states do not allow the exclusions or limitation of incidental or consequential damage, so the limitations or exclusions may not apply to you.

6. THE COMPANY'S RESPONSIBILITIES:

A. The Company agrees to provide all necessary parts and materials only (no labor) to correct any warranted defect providing written notice is received by the Company within the applicable warranty period.

7. THE OWNER'S RESPONSIBILITIES:

A. It is the responsibility of owner to ensure that each product is fit for its intended purpose and that the conditions it will be used in are suitable.

B. The Boat Lift Cradles must remain completely out of the water when the boat lift is not in use.

System Maintenance Program

Annual Maintenance Program

In addition to providing a complete service manual and staff training for the boatlifts, and in an effort to continue to deliver the highest possible level of service Golden Manufacturing offers an annual maintenance plan to each of our clients for two years from date of delivery at no charge.

The program performed covers a complete inspection of the lift system and all components. The program includes a walk through with the facilities management to discuss any concerns or to identify any potential issues.

Upon competition of the site visit inspection a full report of any findings will be produced and delivered to the facilities management. Any issues found will be immediately addressed and resolved. Any observed maintenance issues will be identified, and recommendations will be made to the facility management for better care of the system.

To coordinate the inspection with the facilities management Golden Manufacturing will notify the facilities management 30 days prior to the intended inspection date. It is preferred that management be onsite during this inspection.

Golden Manufacturing has local representatives and provides proactive annual maintenance plan has multiple benefits for the client. Golden Manufacturing is committed to quality, safety. This proactive and preventative approach helps clients save time and costs and allows Golden Manufacturing to continue to set higher standards in the marina industry.

Past Performance

Golden Manufacturing prides itself on anticipating clients' needs and challenges. We have been proactive in advising clients of foreseen issues upfront thereby preventing most unanticipated issues.

Below is a scenario for a like kind project where issues occurred and an immediate "no questions asked" approach was taken to repair the issues.

River Cove Marina in Miami has been in service for nearly 13 years. Over those 13 years we have seen the following issues. Also, provided are the actions taken:

Quantity of Lifts: 68

1. Limit Switches - In lifts that were rarely used we found that the internal micro switch would seize up. We also found water intrusion. Micro switches were immediately replaced. Golden and the Limit Switch manufacturer discussed the issue and came up with a solution. Limit switches were upgraded to prevent this problem from happening in the future. Those new upgraded switches are now in use without problem. Note that out of the 68 lifts only 8 limit switches incurred this problem. For the water intrusion our solution was to provide a drain hole which eliminated the problem.

2. Cable Fraying - Cable fraying issues were discovered on 4 of the 68 lifts. Golden immediately replaced the cables at no charge. Golden immediately identified the issue as customer error by allowing the cables to go slack. Our solution was to provide cable keeps on all boatlifts thereby prohibiting the cables going slack.

3. Gear Box Noises - 2 of the 68 installed boat lifts experienced gear box noises. This was found to be a bearing defect. Golden immediately replaced the gear boxes at no charge. The defective gear boxes were sent back to the manufacturer and the cause was confirmed that there were defective bearings. Bearings have since been upgraded in our new Sea drives eliminating the issue,

Golden has had minimal issues and zero failures with the many marina applications in service.