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a Florida Corporation
Introduces



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WATER RESORT

ELEVATED WATER RESORTS, LLC IS A MEMBER OF THE INTERNATIONAL ECOTOURISM ASSOCIATION



Following the Principles of Ecotourism:

- 1) Minimize impact.
- 2) Build environmental and cultural awareness and respect.
- 3) Provide positive experiences for both visitors and hosts.
- 4) Provide direct financial benefits for conservation.
- 5) Provide financial benefits and empowerment for local people.
- 6) Raise sensitivity to host countries' political, environmental, and social climate.

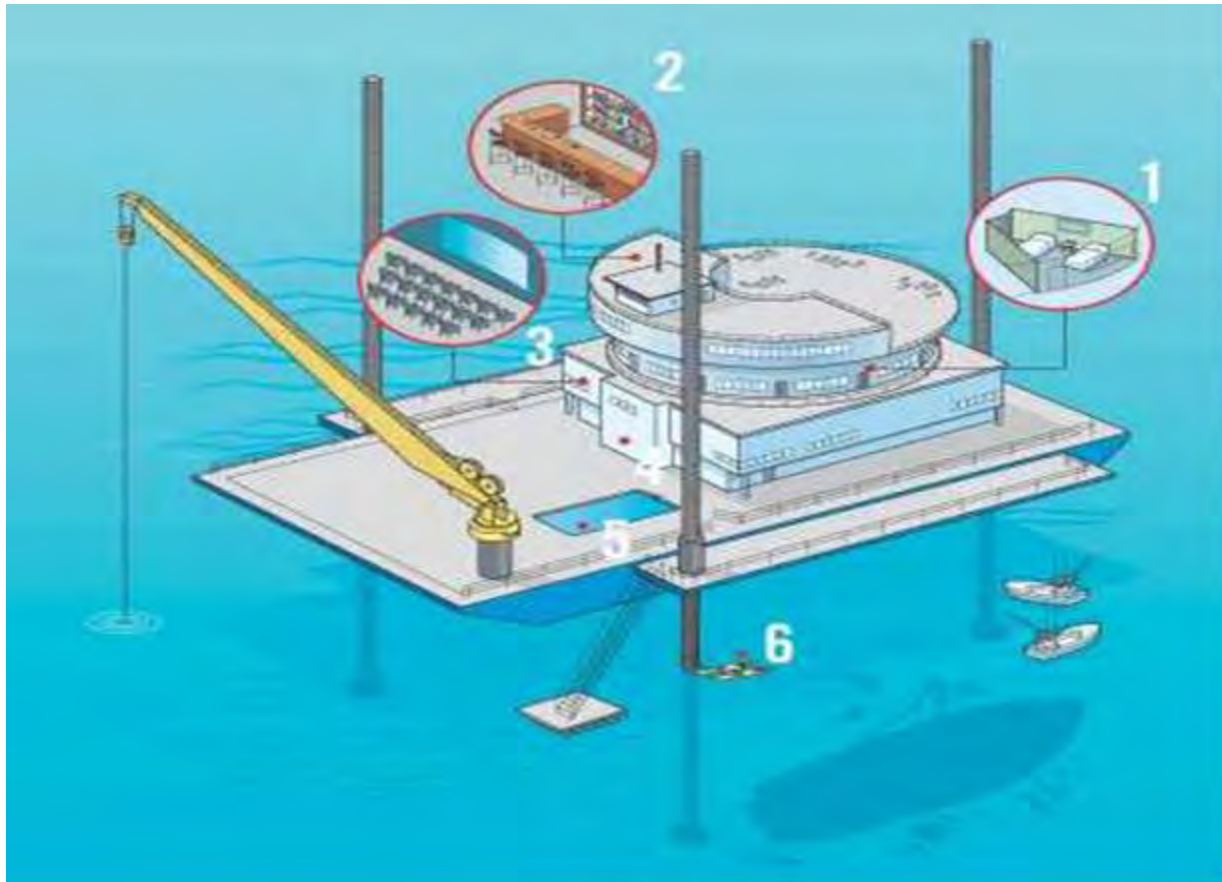
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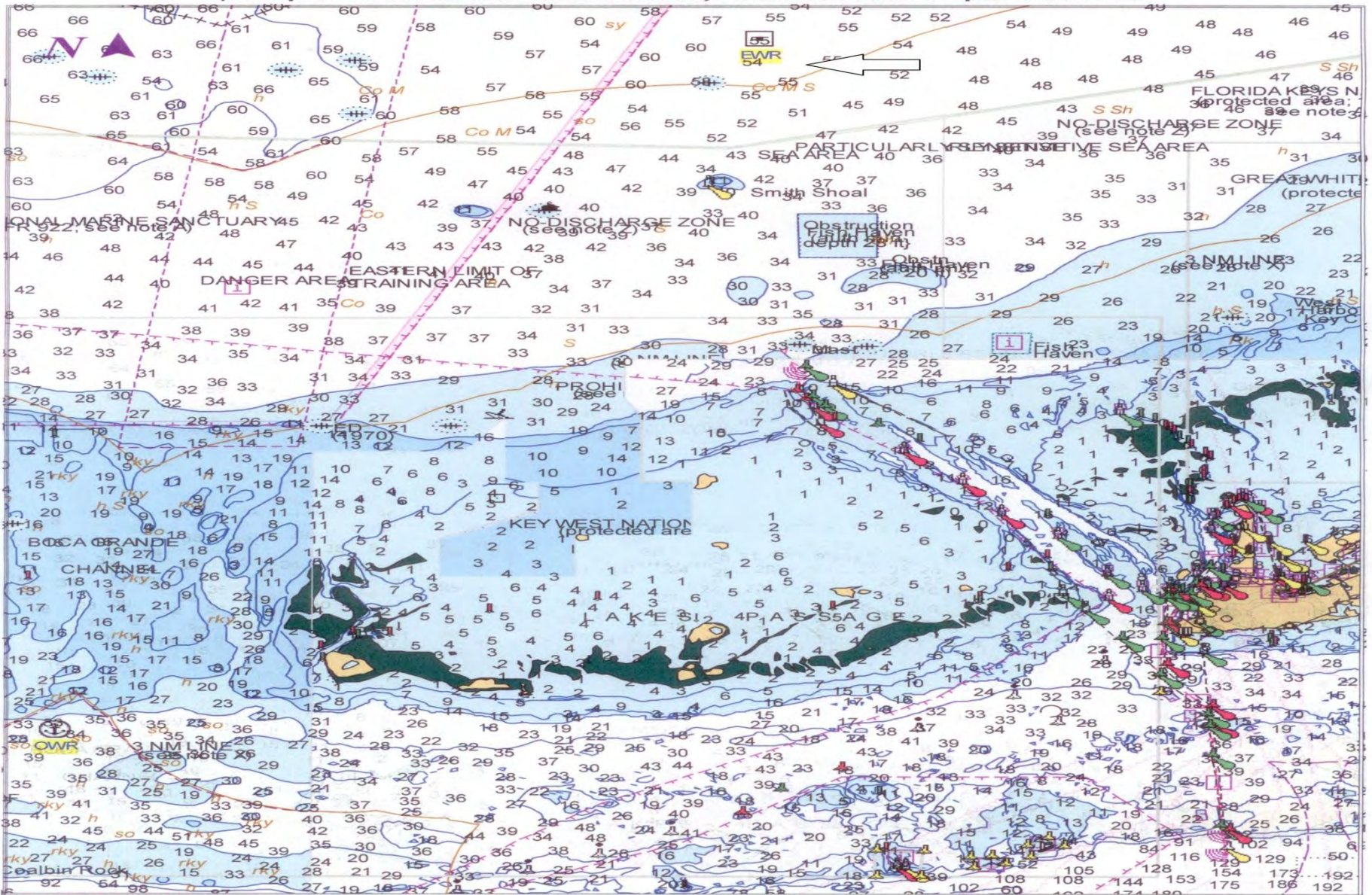
Below is an excerpt from Outside Magazine, May 2004.

“Hotel Oceana: An innovative dive outfitter lays plans to build a futuristic platform resort—right next to the reef...”

“The allure of scuba diving far from shore has always been offset by the requisite marathon boat ride and double dose of Dramamine.”



U.S. - EAST AND GULF COASTS. FLORIDA. CAPE CANAVERAL TO KEY WEST. - 1 : 457,000
(Passport World Charts - vector format) Chart #U11460 - Depth Units: Feet



FL Keys National Marine Sanctuary initial response to permit request:

FKNMS' initial reaction based upon preliminary review of this application is that the project does not appear to be eligible for permitting in the sanctuary. In order to receive a permit, the project would need to meet all seven criteria described in sanctuary permitting regulations (15 CFR 922.166(a)(3)(i) through (vii)).

In particular, please note that you would need to demonstrate that the activity must occur within sanctuary waters in order to satisfy project purposes (15 CFR 922.166(a)(3)(vi)) and that the purposes could not be achieved outside of the sanctuary.

For example, you would be required to show why the educational benefits of the project could not be derived from a shore-based resort offering similar opportunities to the public as the proposed offshore resort. Also, as required by permitting criteria at 15 CFR 922.166(a)(3)(iv), (v), and (vii), FKNMS would need to carefully assess all potential direct, indirect and cumulative impacts of the project and the extent to which the project would further sanctuary goals and purposes. The evaluation of these factors is not yet possible based on the information provided in the application.



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SCOTT'S FISHBOAT



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Pfitzco, Inc.

Marine Engineering Sciences

Naval Architects
Surveyors

Marine Engineers
Consultants

23 September 2010

LCDR Randy Jenkins
Commanding Officer (MSC)
US Coast Guard
2100 Second Street SW Stop 7102
Washington, D.C. 20593-7102

Ref: Jack-Up vessel Oceana

Sir;

As we briefly discussed on the phone earlier this morning, it is the objective of a group of investors to position an elevated platform off the coast of South Florida in the US exclusive economic zone. The platform will consist of four fixed legs securely set on sea floor, which in turn support a structural platform and associated accommodations, or resort hotel, above.

The elevated platform will initially be floated into position unmanned, but from then on the legs shall be firmly set on the sea floor. At no time during normal operations will the unit rely on any form of buoyant support. The structure is being designed to withstand 200 mph winds and associated current and waves forces in case of hurricane with the intention that the unit will stay in place, regardless of weather.

It is intended that the vessel will remain in the same position for an extended period of time and guests will transit on and off by ferry craft (not pertinent for discussion here). Currently, it is thought that the unit will consist of the aforementioned (4) legs, a 200 foot x 104 foot x 16 foot main platform, and a 100 foot diameter hotel structure approximately 50 feet in height.

The hotel is composed of four accommodation decks capable of housing just over 100 guests, with additional accommodations and storage inside the platform itself for roughly 35 support staff, supplies, and machinery. The unit will be held up, free of the water, with a non-buoyant mooring shroud giving the appearance that the hotel is closer to the waterline than is actually the case. See the artistic rendition attached.

With the above items in mind there are several concerns. First, understand that we, and the owners, are interested in providing a safe structure in full compliance with all appropriate regulatory bodies. That said, we are not sure which regulatory body, if any, has jurisdiction over such a structure.

It is worth saying that the following guidelines and rule sets are being used through the design phase of the Oceana, although none appear to be expressly required:

46CFR SubChapter K (For this discussion the vessel can be assumed as under 100 GT)
COLREGS
ABS Rules for Building and Classing Barges
ABS Rules for Building and Classing Mobile Offshore Drilling Units
ABS Guide for Building and Classing Passenger Vessels
SOLAS
MARPOL
IMO FSS Code

Specifically, we would like your guidance in determining what, if any, requirements the USCG may have and accordingly we would like to set up a "Concept Review Meeting" via teleconference, or in person, such that we can start heading towards an agreed solution.

Appropriate Parties for "Concept Review Meeting"
MSC – Major Vessel Branch Chief – LCDR Randy Jenkins
UCSG – Sector Key West
Owner – Doug Pope
Designer – Pfitzco / Rob Norton

We appreciate your input and simply want to find the most cost-effective and safe solution for all interested groups.

Best Regards,

Rob Norton

Rob Norton P.E.

Pfitzco, Inc.

1801 B East Sahlman Dr.

Tampa, FL 33605

813/248-1668

Jackup Barge Oceana: 4-Leg Configuration - CURRENT, WIND, and WAVE STABILITY - To ABS Requirements

VARIABLES

Jackup Barge

$Depth_{jackup} := 23\text{-ft}$	Depth of Jackup Barge Hull
$L_{jackup} := 230\text{-ft}$	Length of Jackup Barge Hull (Longest Dimension)
$N_{spud} := 4$	Number of Legs
$D_{spud} := 96\text{-in}$	Diameter of Spud
$Leg_Thickness := 1.25\text{in}$	
$Jack_Height := 12\text{-ft}$	Height of Jack Structure
$Air_Draft := 20\text{ft}$	Height of Jackup Hull Out of Water
$D_{mud} := 0\text{ft}$	Distance leg is set in the mud (assume worst case for overturning)
$H_{accom} := 59.5\text{ft}$	Height of accommodations
$L_{accom} := 100\text{ft}$	Length of accommodations
$W_{Barge} := 5000000\text{lb}$	Lightship Weight of Barge (Assumed 2500 tons)
$D_{between_legs} := 96\text{-ft}$	Shortest Distance Between Legs

Wind/Water/Wave Characteristics

$D_{water_low} := 60\text{ft}$	Water Depth at Low Tide
$Tide := 0.61\text{m}$	Total Tide Fluctuation
$Surge := 4.572\text{m}$	
$H_w := 10.4\text{m}$	Wave Height
$T_w := 10.82\text{-sec}$	Wave Period
$L_w := 103.2 \frac{\text{m}}{\text{s}}$	Wave Length
$V_{current} := 3.5\text{-Knot}$	Assumed Current Velocity

$$\text{Knot} := 1.68780986 \cdot \frac{\text{ft}}{\text{sec}} \quad \text{Definition of Knot}$$

$V_{\text{wind}} := 130.3 \cdot \text{Knot}$ Assumed Wind Velocity (Per ABS Offshore Drilling Units)

Constants & Miscellaneous Calculations

$g = 32.174 \frac{\text{ft}}{\text{s}^2}$ Gravity Constant

$D_{\text{water_high}} := D_{\text{water_low}} + \text{Tide} + \text{Surge}$ $D_{\text{water_high}} = 77.001 \text{ ft}$ Water Depth at High Tide

$\text{Mean_Water_Depth} := \frac{(D_{\text{water_low}} + D_{\text{water_high}})}{2}$ Mean_Water_Depth = 68.501 ft

$C_{d_flat_plate} := 1.50$ For Homogeneous Flow (Current & Wind)

$C_{d_cylinder} := 0.35$ For Homogeneous Flow (Current & Wind)

$\nu := 10^{-5} \frac{\text{ft}^2}{\text{sec}}$ Viscosity of Water

$\rho_{\text{sw}} := 2.0 \cdot \frac{\text{lb} \cdot \text{sec}^2}{\text{ft}^4}$ Mass of Salt Water

$\nu_{\text{air}} := 1.56 \cdot 10^{-5}$ Viscosity of air

$\rho_{\text{air}} := 0.002378 \cdot \text{lb} \cdot \frac{\text{sec}^2}{\text{ft}^4}$ Density of Air

Wave Force on Legs from *Oceanographical Engineering, Robert L Wiegel*

$L_o := g \cdot \frac{T^2}{2 \cdot \pi}$ $L_o = 599.488 \cdot \text{ft}$ Wave Period Coefficient

$DL_{o_high} := \frac{D_{\text{water_high}}}{L_o}$ $DL_{o_high} = 0.128$ Wave Period Factor

$DL_{\text{high}} := -10.242 \cdot DL_{o_high}^6 + 32.428 \cdot DL_{o_high}^5 - 39.728 \cdot DL_{o_high}^4 + 23.533 \cdot DL_{o_high}^3 - 6.7209 \cdot DL_{o_high}^2 + 1.7031 \cdot DL_{o_high} + 0.$

$DL_{\text{high}} = 0.168$ Regression Developed from Appendix 1

$L_{\text{high}} := \frac{D_{\text{water_high}}}{DL_{\text{high}}}$ $L_{\text{high}} = 459.118 \cdot \text{ft}$ Estimated Wavelength

$$u_{\max_high} := \pi \cdot \frac{H}{T} \cdot \left(\frac{\cosh(2 \cdot \pi \cdot DL_{high})}{\sinh(2 \cdot \pi \cdot DL_{high})} \right) \quad u_{\max_high} = 12.648 \frac{\text{ft}}{\text{s}} \quad \text{Effective Wave Velocity}$$

$$N_R := u_{\max_high} \cdot \frac{D_{spud}}{\nu} \quad N_R = 1.012 \times 10^7 \quad \text{Reynolds Number}$$

$$UTD := u_{\max_high} \cdot \frac{T}{D_{spud}} \quad UTD = 17.107 \quad \text{Factor used to determine the drag and mass coefficient}$$

Drag & Mass Coefficients From Figure 7-58 and pg. 7-109 in SPM USACE

$$C_D := 0.7 \quad \text{Drag coefficient, Wave against circular pile}$$

$$C_m := 1.5 \quad \text{Mass Coefficient, Wave against circular pile}$$

Coefficients used to calculate force (Wave Height Small Compared to Wave Length and Water Depth)

$$K_1 := \frac{(4 \cdot \pi \cdot DL_{high} + \sinh(4 \cdot \pi \cdot DL_{high}))}{16 \cdot (\sinh(2 \cdot \pi \cdot DL_{high}))^2} \quad K_1 = 0.243$$

$$K_2 := 1$$

$$K_3 := \frac{\left[1 + \frac{1}{2} \cdot (4 \cdot \pi \cdot DL_{high})^2 + 4 \cdot \pi \cdot DL_{high} \cdot \sinh(4 \cdot \pi \cdot DL_{high}) - \cosh(4 \cdot \pi \cdot DL_{high}) \right]}{64 \cdot (\sinh(2 \cdot \pi \cdot DL_{high}))^2} \quad K_3 = 0.075$$

$$K_4 := \frac{(1 + 2 \cdot \pi \cdot DL_{high} \cdot \sinh(2 \cdot \pi \cdot DL_{high}) - \cosh(2 \cdot \pi \cdot DL_{high}))}{2 \cdot \sinh(2 \cdot \pi \cdot DL_{high})} \quad K_4 = 0.285$$

$$\text{SIN} \beta_{hf} := \frac{(\pi \cdot D_{spud} \cdot C_m \cdot K_2)}{8 \cdot H \cdot C_D \cdot K_1} \quad \text{SIN} \beta_{hf} = 0.813$$

$$F_h := \pi \cdot \rho_{sw} \cdot D_{spud} \cdot H^2 \cdot \frac{L_{high}}{T^2} \cdot \left(\frac{\pi}{4} \cdot \frac{D_{spud}}{H} \cdot C_m \cdot K_2 \right) \quad F_h = 6.339 \times 10^4 \cdot \text{lb} \cdot \text{ft} \quad \text{Force exerted on one leg}$$

$$M_{so} := \rho_{sw} \cdot D_{spud} \cdot \left(H \cdot \frac{L_{high}}{T} \right)^2 \cdot \left(\frac{\pi}{4} \cdot \frac{D_{spud}}{H} \cdot C_m \cdot K_4 \right) \quad M_{so} = 2.644 \times 10^6 \cdot \text{ft} \cdot \text{lb} \cdot \text{ft} \quad \text{Moment exerted on one leg}$$

$$I_o := \frac{M_{so}}{F_h} \quad I_o = 41.708 \cdot \text{ft} \quad \text{Force application height - moment arm}$$

$$I_{\text{total}} := I_o + D_{\text{mud}} \quad I_{\text{total}} = 41.708 \text{ ft} \quad \text{Total Height of force application - moment arm}$$

Current Force on Legs from Shore Protection Manual, USACE

$$R_e := V_{\text{current}} \cdot \frac{D_{\text{spud}}}{\nu} \quad R_e = 4.726 \times 10^6 \quad V_{\text{current}} = 5.907 \frac{\text{ft}}{\text{s}}$$

$$C_g := 27.8 \frac{\text{ft}}{\text{s}} \quad \text{Group Celerity}$$

$$C_w := 31.5 \frac{\text{ft}}{\text{s}} \quad \text{Wave Celerity}$$

$$n := \frac{C_g}{C_w} \quad n = 0.883$$

$$t := 0 \quad \text{Max Force Occurs @ } t=0$$

$$T = 10.82 \text{ s} \quad \text{Wave Period}$$

$$K_{\text{DM}} := \left(\frac{1}{4}\right) \cdot n \cdot \left[\cos\left[\frac{(2 \cdot \pi \cdot t)}{T}\right] \right] \cdot \left[\cos\left[\frac{(2 \cdot \pi \cdot t)}{T}\right] \right] \quad K_{\text{DM}} = 0.221 \quad \text{Pile Drag Force Factor}$$

$$\rho_{\text{sw}} := 2.0 \cdot \frac{\text{lb} \cdot \text{sec}^2}{\text{ft}^4} \quad \text{Mass of Salt Water}$$

$$g = 32.174 \frac{\text{ft}}{\text{s}^2} \quad \text{Gravity Constant}$$

$$H_w := 27 \text{ ft} \quad \text{Wave Height}$$

$$C_D := 0.7 \quad \text{Drag coefficient, Wave against circular pile}$$

$$D_{\text{spud}} = 8 \text{ ft} \quad \text{Diameter of Spud}$$

$$F_{\text{current}} := C_D \cdot 0.5 \cdot \rho_{\text{sw}} \cdot g \cdot D_{\text{spud}} \cdot H_w^2 \cdot K_{\text{DM}} \quad F_{\text{current}} = 2.898 \times 10^4 \text{ lbf}$$

$$d := D_{\text{water_high}} \quad d = 77.001 \text{ ft}$$

$$L_w := 338.6 \text{ ft}$$

$$S_D := 0.5 + \left[\left(\frac{1}{2 \cdot n} \right) \cdot \left[0.5 + \frac{\left[1 - \left[\cosh\left[\frac{(4 \cdot \pi \cdot d)}{L_w} \right] \right] \right]}{\left[\frac{(4 \cdot \pi \cdot d)}{L_w} \right] \cdot \left[\sinh\left[\frac{(4 \cdot \pi \cdot d)}{L_w} \right] \right]} \right] \right] \quad S_D = 0.607$$

$$M_{\text{current}} := F_{\text{current}} \cdot S_D \cdot d$$

$$M_{\text{current}} = 4.355 \times 10^7 \frac{\text{ft}^2 \cdot \text{lb}}{\text{s}^2}$$

$$\text{Arm}_{\text{current}} := 0.5 \cdot D_{\text{water_high}} + D_{\text{mud}}$$

$$\text{Arm}_{\text{current}} = 38.501 \text{ ft}$$

Forces on Legs Due to WIND acting on - at 200 MPH (Based on ABS)

$$R_{e_wind} := V_{\text{wind}} \cdot \frac{D_{\text{spud}}}{\nu_{\text{air}}} \quad R_{e_wind} = 1.048 \times 10^{11} \text{ stokes Reynolds Number}$$

Jackup Barge Hull Loads

$$A_{\text{jackup}} := \text{Depth}_{\text{jackup}} \cdot L_{\text{jackup}} \quad A_{\text{jackup}} = 5.29 \times 10^3 \text{ ft}^2 \quad \text{Lateral wind area of Jackup Barge Hull}$$

$$R_{\text{wind_jackup}} := C_{d_flat_plate} \cdot \frac{\rho_{\text{air}}}{2} \cdot A_{\text{jackup}} \cdot V_{\text{wind}}^2 \quad R_{\text{wind_jackup}} = 4.563 \times 10^5 \cdot \text{lb} \cdot \text{ft} \quad \text{Wind force on Jackup Barge Hull}$$

Leg Loads

$$H_{\text{spud_lower}} := \text{Air_Draft} \quad H_{\text{spud_lower}} = 20 \text{ ft} \quad \begin{array}{l} \text{Height of leg exposed under the barge} \\ \text{Note: the legs are considered fully extended} \end{array}$$

$$A_{\text{spud_lower}} := N_{\text{spud}} \cdot H_{\text{spud_lower}} \cdot D_{\text{spud}} \quad A_{\text{spud_lower}} = 640 \text{ ft}^2 \quad \text{Total Area of legs}$$

$$R_{\text{wind_spud_lower}} := C_{d_cylinder} \cdot \frac{\rho_{\text{air}}}{2} \cdot A_{\text{spud_lower}} \cdot V_{\text{wind}}^2 \quad R_{\text{wind_spud_lower}} = 1.288 \times 10^4 \cdot \text{lb} \cdot \text{ft} \quad \text{Force on Legs}$$

Accommodation Loads

$$A_{\text{accom}} := 1.5 H_{\text{accom}} \cdot L_{\text{accom}} \quad A_{\text{accom}} = 8.925 \times 10^3 \text{ ft}^2 \quad \text{Area accommodations assume flat projection}$$

$$R_{\text{wind_accom}} := C_{d_flat_plate} \cdot \frac{\rho_{\text{air}}}{2} \cdot A_{\text{accom}} \cdot V_{\text{wind}}^2 \quad R_{\text{wind_accom}} = 7.699 \times 10^5 \cdot \text{lb} \cdot \text{ft} \quad \text{Force on accommodations}$$

Various Moment Arms

$$\text{Arm}_{\text{accom}} := \text{Air_Draft} + \text{Depth}_{\text{jackup}} + \frac{H_{\text{accom}}}{2}$$

$$\text{Arm}_{\text{accom}} = 72.75 \text{ ft}$$

Center of pressure for accommodations, height above waterline

$$\text{Arm}_{\text{spud_lower}} := \frac{\text{Air_Draft}}{2} \quad \text{Arm}_{\text{spud_lower}} = 10 \text{ ft} \quad \text{Center of pressure for spud, height above waterline}$$

$$\text{Arm}_{\text{jackup}} := \text{Air_Draft} + \frac{\text{Depth}_{\text{jackup}}}{2} \quad \text{Arm}_{\text{jackup}} = 31.5 \text{ ft} \quad \text{Center of pressure for jackup barge hull, height above waterline}$$

$$M_{\text{airtotal}} := \text{Arm}_{\text{accom}} \cdot R_{\text{wind_accom}} + \text{Arm}_{\text{spud_lower}} \cdot R_{\text{wind_spud_lower}} + \text{Arm}_{\text{jackup}} \cdot R_{\text{wind_jackup}}$$

$$M_{\text{airtotal}} = 7.051 \times 10^7 \cdot \text{lb}\cdot\text{ft} \quad \text{Total Moment due to wind loading (About Waterline)}$$

$$R_{\text{air_total}} := R_{\text{wind_accom}} + R_{\text{wind_spud_lower}} + R_{\text{wind_jackup}}$$

$$R_{\text{air_total}} = 1.239 \times 10^6 \cdot \text{lb} \quad \text{Total Wind Force}$$

$$\text{Arm}_{\text{air_total}} := \frac{M_{\text{airtotal}}}{R_{\text{air_total}}} \quad \text{Arm}_{\text{air_total}} = 56.906 \text{ ft} \quad \text{Effective Moment Arm, height above waterline}$$

$$\text{Arm}_{\text{air}} := \text{Arm}_{\text{air_total}} + D_{\text{water_high}} + D_{\text{mud}} \quad \text{Arm}_{\text{air}} = 133.908 \text{ ft} \quad \text{Moment Arm, Height above hard bottom}$$

Axial Loading Component for Barge

$$W_{\text{Load}} := 0 \text{ lbf} \quad 761 \text{ Lt Possible Deck Loading ABS requires } 426,133 \text{ lbs per leg minimum}$$

$$A_{\text{Leg}} := \text{Leg_Thickness} \cdot (D_{\text{spud}} - \text{Leg_Thickness}) \cdot \pi \quad A_{\text{Leg}} = 372.082 \cdot \text{in}^2 \quad \text{Area of one Leg}$$

$$W_{\text{total}} := (W_{\text{Load}} + W_{\text{Barge}}) \quad W_{\text{total}} = 5 \times 10^6 \cdot \text{lb} \quad \text{Total weight supported by legs}$$

Leg Stresses

$$\text{Stress}_{\text{Axial}} := \frac{W_{\text{total}}}{N_{\text{spud}} A_{\text{Leg}}} \quad \text{Stress}_{\text{Axial}} = 3.359 \times 10^3 \cdot \frac{\text{lb}}{\text{in}^2} \quad \text{Axial Stress on Legs}$$

$$r_{\text{spud}} := \frac{D_{\text{spud}}}{2} \quad r_{\text{spud}} = 4 \text{ ft} \quad \text{Radius of leg}$$

$$I_{\text{spud}} := \pi \cdot \text{Leg_Thickness} \cdot r_{\text{spud}}^3 \quad I_{\text{spud}} = 4.343 \times 10^5 \cdot \text{in}^4 \quad \text{Moment of Inertia for one Leg}$$

$$S_{\text{spud}} := \frac{I_{\text{spud}}}{r_{\text{spud}}} \quad S_{\text{spud}} = 753.982 \cdot \text{in}^2 \cdot \text{ft} \quad \text{Section Modulus of one Leg}$$

$$\text{Moment}_{\text{total}} := \left(M_{\text{so}} + \frac{M_{\text{airtotal}}}{N_{\text{spud}}} \right) \quad \text{Moment}_{\text{total}} = 2.027 \times 10^7 \cdot \text{ft}\cdot\text{lb} \quad \text{Total Moment Summation (Per Leg)}$$

$$\text{Stress}_{\text{Bending}} := \frac{(\text{Moment}_{\text{total}})}{S_{\text{spud}}} \quad \text{Stress}_{\text{Bending}} = 2.689 \times 10^4 \cdot \frac{\text{lb} \cdot \text{ft}}{\text{in}^2} \quad \text{Bending Stress Due to Moment}$$

$$\text{Total_Stress}_{\text{max}} := \text{Stress}_{\text{Axial}} + \text{Stress}_{\text{Bending}} \quad \text{Total_Stress}_{\text{max}} = 3.025 \times 10^4 \cdot \frac{\text{lb} \cdot \text{ft}}{\text{in}^2} \quad \text{Additive Stresses}$$

$$\text{Total_Stress}_{\text{min}} := \text{Stress}_{\text{Axial}} - \text{Stress}_{\text{Bending}} \quad \text{Total_Stress}_{\text{min}} = -2.353 \times 10^4 \cdot \frac{\text{lb} \cdot \text{ft}}{\text{in}^2} \quad \text{Reducing Stresses}$$

Note: The Bending Stress is much larger than the Axial Stress and Clearly Controls.

Critical Stress in the Legs

$$S_y := 50000 \frac{\text{lb} \cdot \text{ft}}{\text{in}^2} \quad \text{Yield Strength of the Legs}$$

$$E := 29000000 \cdot \frac{\text{lb} \cdot \text{ft}}{\text{in}^2} \quad \text{Youngs Modulus}$$

$$C_{\text{beam}} := 1 \quad \text{End Restraint Coefficient}$$

$$L_{\text{leg}} := D_{\text{water_high}} + D_{\text{mud}} + \text{Air_Draft} + \text{Depth}_{\text{jackup}} + \text{Jack_Height} \quad L_{\text{leg}} = 132.001 \text{ ft}$$

$$k := \sqrt{\frac{(D_{\text{spud}})^2 + (D_{\text{spud}} - \text{Leg_Thickness})^2}{4}} = 33.721 \cdot \text{in} \quad \text{Radius of Gyration for one Leg}$$

$$\text{Stress}_{\text{critical}} := S_y - \left(\frac{1}{E}\right) \left(\frac{S_y}{2\pi}\right)^2 \left(C_{\text{beam}} \cdot \frac{L_{\text{leg}}}{k}\right)^2 \quad \text{Stress}_{\text{critical}} = 4.518 \times 10^4 \cdot \frac{\text{lb} \cdot \text{ft}}{\text{in}^2}$$

Same Stress as calculated in Column Buckling Stresses - ABS 3.11.5

Calculate Factors of Safety (Axial & Bending Stress)

$$\text{Total_Stress}_{\text{max}} = 3.025 \times 10^4 \cdot \frac{\text{lb} \cdot \text{ft}}{\text{in}^2}$$

Combined Loading Safety Factor Based on Yield Stress:

$$FS_{\text{combined}} := \frac{S_y}{\text{Total_Stress}_{\text{max}}} \quad FS_{\text{combined}} = 1.653$$

Static Loading Safety Factor Based on Critical Stress:

$$FS_{\text{static}} := \frac{\text{Stress}_{\text{critical}}}{\text{Total_Stress}_{\text{max}}} \quad FS_{\text{static}} = 1.494$$

Based on ABS Rules for Mobile Offshore Drilling Units the minimum allowable factor of safety (FS) is:
Combined Loading: 1.25 (axial & bending)
Static Loads: 1.67 (axial & bending)

Jackup Stability When Vessel In Jacked Condition (Combined Loads)

$$M_{\text{countering}} := \frac{D_{\text{between legs}}}{2} \cdot W_{\text{Barge}}$$

$$M_{\text{countering}} = 2.4 \times 10^8 \cdot \text{ft} \cdot \text{lbf}$$

$$M_{\text{overturning}} := (M_{\text{so}} \cdot N_{\text{spud}}) + M_{\text{airtotal}} + (M_{\text{current}} \cdot N_{\text{spud}})$$

$$M_{\text{overturning}} = 8.65 \times 10^7 \cdot \text{lbf} \cdot \text{ft} \quad \text{Jackup will remain upright (this number is less than the countering moment),}$$

$$FS_{\text{overturning}} := \frac{M_{\text{countering}}}{M_{\text{overturning}}}$$

$$FS_{\text{overturning}} = 2.775$$

FUEL TANK SAFETY

WE ARE PLANNING TO HAVE ROUGHLY 8,000 GALLONS OF DIESEL FUEL ONBOARD THE OCEANA, WHICH WILL BE IN SELF-CONTAINED FUEL TANKS AND THESE TANKS WILL BE IN WATER TIGHT COMPARTMENTS. THE TANKS WILL BE ENTIRELY CLOSED TO THE ENVIRONMENT WITH THE USE OF A “PRESSURE / VACUUM “ VALVE (P/V VALVE). THIS VALVE ALLOWS FOR A PRESSURE SETTING, BY SPRING SELECTION INSIDE THE VALVE. THE VALVE WILL HAVE A PRESSURE SETTING FOR BOTH POSITIVE PRESSURE AND VACUUM.

IF THE TANKS, FOR EXAMPLE HEAT UP THROUGH THE COURSE OF THE DAY, ONCE IT REACHES THE POSITIVE PRESSURE SETTING, IT WILL VENT OFF. THROUGH THE COURSE OF THE NIGHT AS THE TANK COOLS IT WILL DRAW AIR IN. THE SAME THING HAPPENS WITH AN OPEN VENT BUT THE PASSAGE OF AIR WITH A P/V VALVE IS REDUCED WHICH SAVES ON FUEL EVAPORATION. EFFECTIVELY THE VALVE, AND TANK, ARE ALWAYS KEPT CLOSED BY THE SPRING LOADED CHECKS EXCEPT FOR SHORT QUICK OPENING TO ALLOW THE PASSAGE OF AIR WHEN THE PRESSURE SETS ARE EXCEEDED.

IF THE VESSEL SHOULD SINK, THE TANK VENTED THROUGH A P/V VALVE WILL SENSE THE EXTERNAL WATER PRESSURE AS IT GOES DOWN. THIS WILL TRIP THE VALVE TO OPEN ALLOWING WATER TO RUSH INTO THE TANK. ONCE ON BOTTOM AND THE PRESSURES EQUALIZE, THE VALVE WILL LOCK OFF AGAIN NOT ALLOWING ANY WATER OR FUEL OUT OF THE TANK. THIS HELPS TO INSURE THAT NO FUEL WILL LEAK OUT THROUGH THE VENT AND ALSO INSURES THAT EXTERNAL PRESSURE EXPERIENCED BY THE TANK AS IT GOES DOWN DOES NOT CRUSH OR STRUCTURALLY DAMAGE IT. THE TANK WILL SEEK PRESSURE EQUILIBRIUM. BASED ON ALL OF THIS THE OCEANA WOULD HOLD HER FUEL IF SHE SANK. A VALVE WITH A BLIND ON THE OPEN FLANGE WILL BE PLACED AT TWO CORNERS OF THE TANK TO EASILY ALLOW FOR THE CONTAINED PUMPING OUT OF THE FUEL TANK DURING SALVAGE OPERATIONS.

WE WILL BE ABSOLUTELY SURE THAT ALL THE DECK MATERIALS, IE: SAND, PAVERS, ROCKS, WOOD AND PAINT WILL BE FREE OF ANY CONTAMINANTS THAT MAY LEACH INTO THE RAIN WATER THAT RUNS OFF THE VESSEL. PARKING LOTS

TO THE FULLEST EXTENT POSSIBLE VEGETATION WILL BE NATURAL.

THE RESORT WILL BE EQUIPPED WITH MARINE SANITATION DEVICES WHICH PERFORM MUCH LIKE HOME SEPTIC SYSTEMS. THE SOLID MATERIAL IS CONSUMED BY THE LIVING ORGANISMS INSIDE THE TANKS AND ALL THAT DRAINS OFF IS CLEAR LIQUID. THIS CLEAR LIQUID AND ALL GRAY WATER WILL BE FILTERED AND RECYLCED THROUGH TUBE STEAM GENERATORS THAT WILL COLLECT HEAT FROM THE EXHAUST OF THE DIESEL GENERATORS AND PRODUCE STEAM TO POWER STEAM DRIVEN GENERATORS. WE HOPE TO RECOVER UP TO 30% OF THE ENERGY THE DIESEL GENERATORS CONSUME.

THE GENERATORS ON THE RESORT WILL EXHAUST INTO THE AIR ABOUT 80 FEET ABOVE THE OCEAN.

WE WILL RELY HEAVILY ON SOLAR AND WIND POWER. THIS IN CONJUNCTION WITH CONVERTING OUR WASTE WATER INTO STEAM GENERATED ELECTRICITY WILL ENABLE US TO KEEP OUR CARBON FOOT PRINT VERY LOW. THE VESSEL WILL BE AS GREEN AS ECONOMICALLY FEASIBLE.

THE RESORT WILL HOUSE FIFTEEN 22 FOOT DIESEL POWERED FISHING BOATS, TWO 35 FOOT SHUTTLE VESSELS AND TWO SUPPLY/FUEL VESSELS. ALL THESE VESSELS WILL BE DIESEL POWERED AND ALL WILL EXHAUST INTO THE AIR, NOT INTO THE WATER AS MOST ALL OTHER VESSELS DO, PUTTING THEIR EXHAUST, FUEL AND OIL RESIDUE DIRECTLY INTO THE WATER.

THE RESORT AND ALL ITS ANCILLARY VESSELS COMBINED WILL PUT LESS POLLUTION INTO THE WATER THAN JUST ONE OF THE SMALLEST OUTBOARD USED ON THE OCEAN TODAY.

LOGISTICALLY SPEAKING, OUR OPERATION WILL BE VERY EFFICIENT.

OUR GUESTS WILL TYPICALLY BE OUT FOR A 3, 4 OR 7 DAY STAY. WHEN OUR GUESTS GO FISHING THEY SIMPLY GO DOWN TO THE MAIN DECK AND GET ON ONE OF OUR BOATS AND TRAVEL FROM 1 TO MAYBE AS MUCH AS 6 MILES TO FISH. IT HAS BEEN SAID THAT WE WILL BE IN ONE OF THE BEST FISHING SPOTS IN THE KEYS AND THE RESORT ITSELF WILL SOON BECOME THE BEST FISHING SPOT IN THE AREA.

THE FACT THAT OUR GUESTS WILL TRAVEL A SHORT DISTANCE TO FISH WILL SAVE US AND THE ENVIROMENT A LOT OF STRESS.

ALL TRASH AND ORGANIC GARBAGE (SUCH AS FOOD SCRAPS) WILL BE PROCESSED AND TAKEN TO SHORE FOR PROPER DISPOSAL OR RECYCLING.

GUESTS AND CREW WILL BE GIVEN INCENTIVES TO CLEAN UP THE OCEAN AND SEA FLOOR, I.E... KAYAKERS WILL BE GIVEN A DIP NET, TONGS AND TRASH BAGS WHEN THEY RENT A KAYAK. THE GUEST THAT PICKS UP THE MOST TRASH GETS A FREE RENTAL THE NEXT DAY.

WHILE INCORPORATING EXISTING FKNMS EDUCATIONAL MATERIALS EWR WILL IMPLEMENT A COMPREHENSIVE EDUCATIONAL PROGRAM FOR GUESTS AND CREWMEMBERS. WE BELIEVE THIS WILL ENABLE OUR GUESTS TO REALIZE HOW FRAGILE THE SANCTUARY IS AND HOW THEY CAN BE PROACTIVE IN IMPROVING IT'S PROTECTION.

EWR WILL ENDEAVOR TO MAKE EACH OF OUR GUEST A FKNMS AMBASSADOR. WE WILL ENCOURAGE OUR GUESTS TO CONTINUE TO SUPPORT OCEAN ENVIRONMENTALISM AROUND THE WORLD.

EWR WILL HAVE A COMPREHENSIVE ENVIRONMENT RESPONSE PLAN AND A TEAM IN PLACE IN THE EVENT THAT AN ENVIRONMENTAL PROBLEM ARISES AROUND THE RESORT. EWR WILL WORK IN COOPERATION WITH ALL AGENCIES TO SUPPORT THIS RESPONSE PLAN AND FOLLOW ALL GUIDELINES IN THE FKNMS MANAGEMENT PLAN. THIS TEAM AND EQUIPMENT WILL BE AVAILABLE IF REQUESTED BY OTHER AGENCIES IN THE KEYS, IN THE EVENT OF AN ENVIROMENTAL EMERGENCY

EWR WILL DEVELOP AND ADOPT A SUBMERGED CULTURAL RESOURCE ACTION PLAN, TO PROTECT THE SURROUNDING OCEAN. THIS WILL HELP TO INSURE THE LONG-TERM IMPROVEMENT OF OUR NATURAL RESOURCES.

EWR WILL EMPLOY A WATER QUALITY ACTION PLAN TO MONITOR THE WATER AROUND THE RESORT.

THE RESORT'S THEME WILL BE THAT OF A TROPICAL ISLAND WITH MINIMUM EXTERIOR LIGHTING TO CREATE AN AMBIANCE WHICH WILL ENABLE OUR GUESTS WITH THE VISUAL ACUITY TO ENJOY AN UNENCUMBERED VIEW OF THE NIGHT SKY.

THE RESORT WILL PROVIDE ACCOMEDATIONS FOR A SMALL SCIENTIFIC LABORATORY AND TWO ROOMS FOR THE LAB PERSONNEL TO STAY WHILE ON THE RESORT.

EWR HAS HAD DISCUSSIONS WITH MEMBERS OF THE NATIONAL WEATHER SERVICE ABOUT OPERATING A MARINE WEATHER REPORTING STATION ABOARD THE RESORT.