

**WATSON ISLAND MOORING FIELD PROJECT**

Miami Beach, Florida

CLIENT:  
**CITY OF MIAMI**

3500 Pan American Blvd.  
Miami, FL 33131

ENVIRONMENTAL CONSULTANT:

**OCEAN CONSULTING, LLC**  
340 Minorca Avenue, Suite 7  
Coral Gables, Florida 33134  
Tel: (305) 921-9344  
Fax: (305) 677-3254

CONTRACTOR:

PROJECT ENGINEER:

**DYNAMIC ENGINEERING SOLUTIONS, INC.**

351 S. Cypress Road, Suite 303  
Pompano Beach, FL 33060  
Office - 954-545-1740  
Fax - 954-545-1721

SEAL / SIGNATURE / DATE

**PERMIT DRAWINGS**

Issue #	Issue Date
①	August 23, 2018

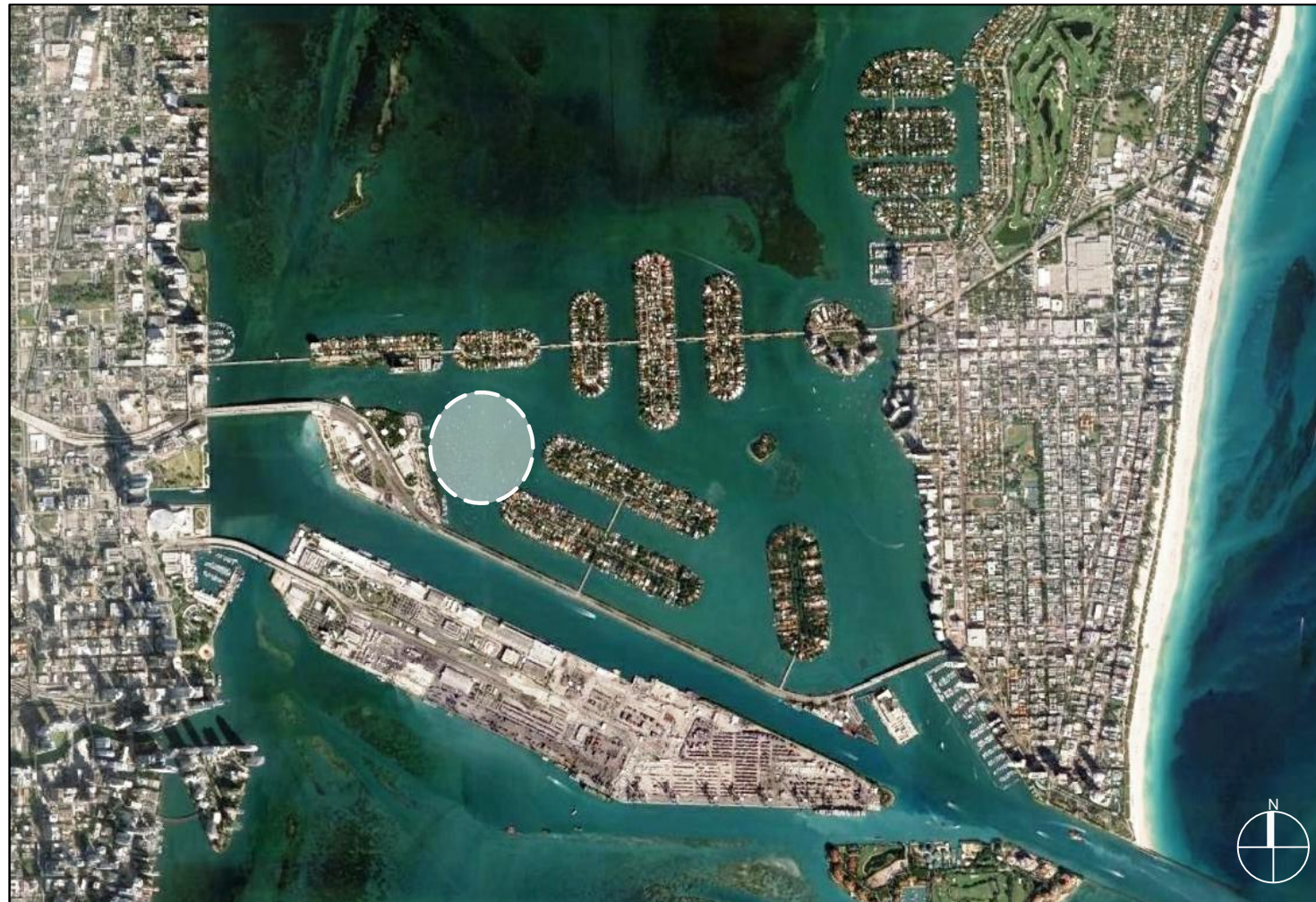
PROJECT: 18-8105

COVER SHEET

SCALE : AS SHOWN  
SHEET NO.

**S-1**

# WATSON ISLAND MOORING FIELD PROJECT



AERIAL LOCATION MAP

GENERAL NOTES:

- ELEVATIONS SHOWN REFER TO THE NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929.
- ALL DIMENSIONS ON PLANS ARE SUBJECT TO VERIFICATION IN THE FIELD.
- IT IS THE INTENT OF THESE PLANS TO BE IN ACCORDANCE WITH APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION. ANY DISCREPANCIES BETWEEN THESE PLANS AND APPLICABLE CODES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF ENGINEER BEFORE PROCEEDING WITH WORK. CONTRACTOR AND ALL SUBCONTRACTORS ARE RESPONSIBLE FOR ALL LINES, ELEVATIONS, AND MEASUREMENTS IN CONNECTION WITH THEIR WORK.
- IT IS THE INTENT OF THESE PLANS AND THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH LOCAL, STATE, AND FEDERAL ENVIRONMENTAL PERMITS ISSUED FOR THIS PROJECT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE AND GOVERN HIMSELF BY ALL PROVISIONS OF THESE PERMITS.
- APPLICABLE BUILDING CODE: FLORIDA BUILDING CODE, 2017 EDITION (AND CURRENT ADDENDUMS).
- APPROVED CONTRACTOR TO DETERMINE THE SUITABILITY OF EXISTING STRUCTURES AND VERIFY ALL DIMENSIONS. THE APPROVED CONTRACTOR IS RESPONSIBLE FOR ALL METHODS, MEANS, SEQUENCES AND PROCEDURES OF WORK.
- DO NOT SCALE DRAWINGS FOR DIMENSIONS.
- CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO COMMENCING WORK.
- CONTRACTOR TO PROPERLY FENCE AND SECURE AREA WITH BARRICADES.
- ANY DEVIATION AND/OR SUBSTITUTION FROM THE INFORMATION PROVIDED HEREIN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.
- ALL NEW MATERIALS AND/OR PATCHWORK SHALL BE PROVIDED TO MATCH EXISTING MATERIALS AND/OR ADJOINING WORK WHERE PRACTICAL EXCEPT AS SPECIFICALLY NOTED HEREIN.
- LICENSED CONTRACTOR SHALL USE ALL POSSIBLE CARE TO PROTECT ALL EXISTING MATERIALS, SURFACES, AND FURNISHINGS FROM DAMAGE DURING ALL PHASES OF CONSTRUCTION.
- THE LICENSED CONTRACTOR TO INSTALL AND REMOVE ALL SHORING AND BRACING AS REQUIRED FOR THE PROPER EXECUTION OF THE WORK.
- ALL NEW WORK AND/OR MATERIALS SHALL CONFORM TO ALL REQUIREMENTS OF EACH ADMINISTRATIVE BODY HAVING JURISDICTION IN EACH PERTAINING CIRCUMSTANCE.



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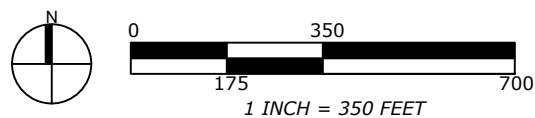
**EXISTING CONDITIONS**

SCALE : AS SHOWN  
SHEET NO.






**S-2**

**NOTES:**

1. HYDROGRAPHIC SURVEY CONDUCTED ON 5/4/15 AND 5/6/15.
2. CONTOURED ELEVATIONS ARE IN FEET AND REFERENCED TO MIAMI-DADE MEAN LOW WATER.
3. RESOURCE SURVEY CONDUCTED ON 7/22/15 AND 7/23/15.
4. AERIAL SOURCE: LABINS 2012.

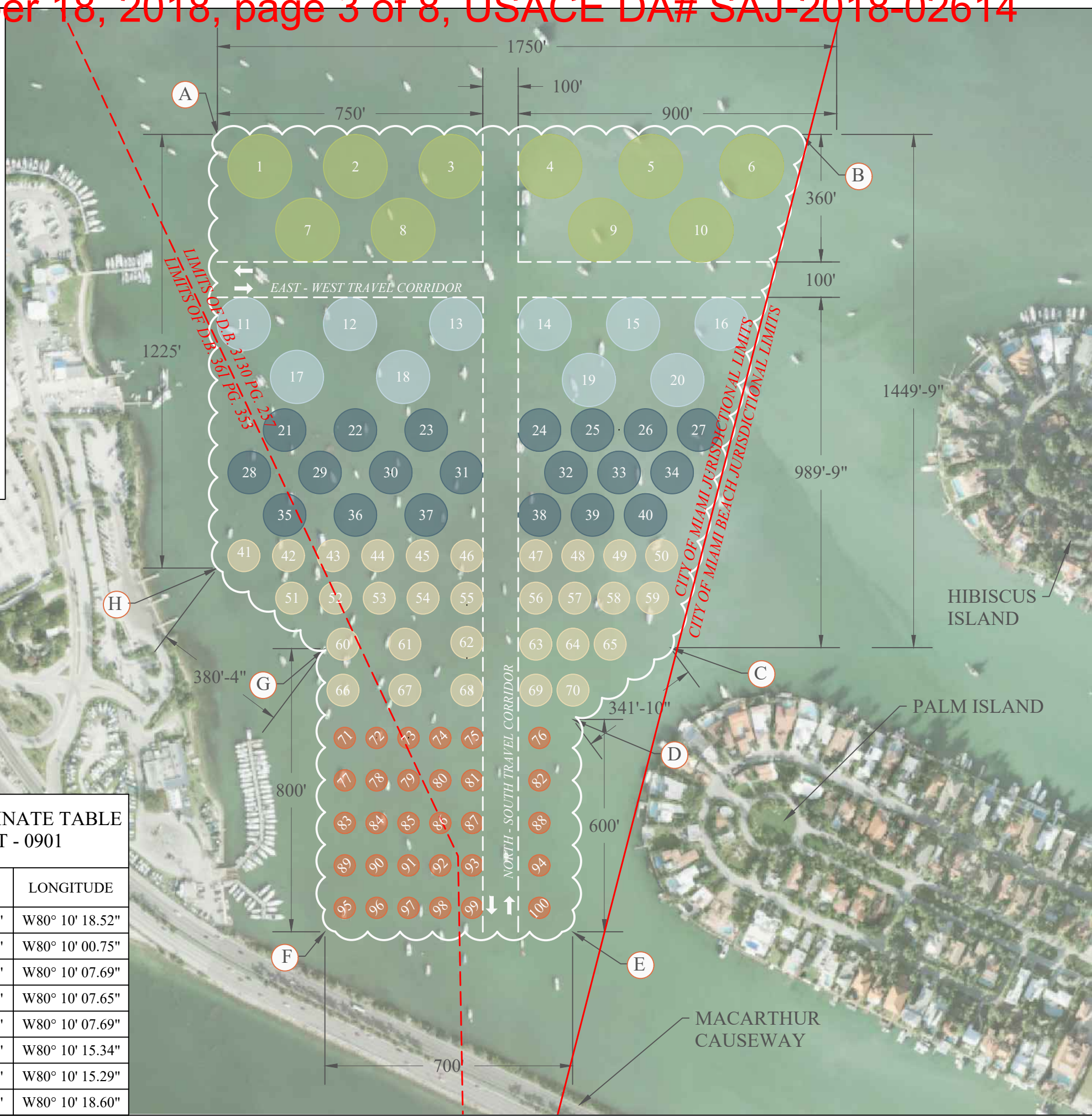
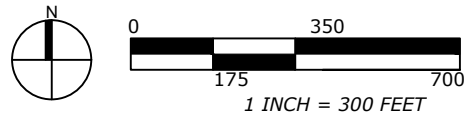


**LEGEND:**

-  (10) - 60' VESSEL MOORING (180' DIA.)
  -  (10) - 50' VESSEL MOORING (150' DIA.)
  -  (20) - 40' VESSEL MOORING (120' DIA.)
  -  (30) - 30' VESSEL MOORING (90' DIAMETER)
  -  (30) - 20' VESSEL MOORING (60' DIAMETER)
- (SEE MOORING SYSTEM DETAIL ON S-4)

 MOORING FIELD BOUNDARY CORNER LOCATION (SEE DETAIL ON S-5)

NOTE: 100 TOTAL MOORING ANCHORS



MOORING AREA BUOY BOUNDARY COORDINATE TABLE  
STATE PLANE, NAD 83, FLORIDA EAST - 0901

CORNER	NORTHING	EASTING	LATITUDE	LONGITUDE
A	529260.0267	928679.6878	N25° 47' 14.46"	W80° 10' 18.52"
B	529260.0267	930331.3274	N25° 47' 23.93"	W80° 10' 00.75"
C	527810.2621	929959.3339	N25° 47' 00.04"	W80° 10' 07.69"
D	527607.4773	929683.4969	N25° 46' 58.03"	W80° 10' 07.65"
E	527007.3014	929683.4969	N25° 46' 52.09"	W80° 10' 07.69"
F	527007.3014	928983.6924	N25° 46' 52.13"	W80° 10' 15.34"
G	527807.7571	928983.6924	N25° 47' 00.06"	W80° 10' 15.29"
H	528035.0267	928679.6878	N25° 47' 02.33"	W80° 10' 18.60"

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**PROPOSED MOORING  
FIELD LAYOUT**

SCALE : AS SHOWN  
SHEET NO.

**S-3**

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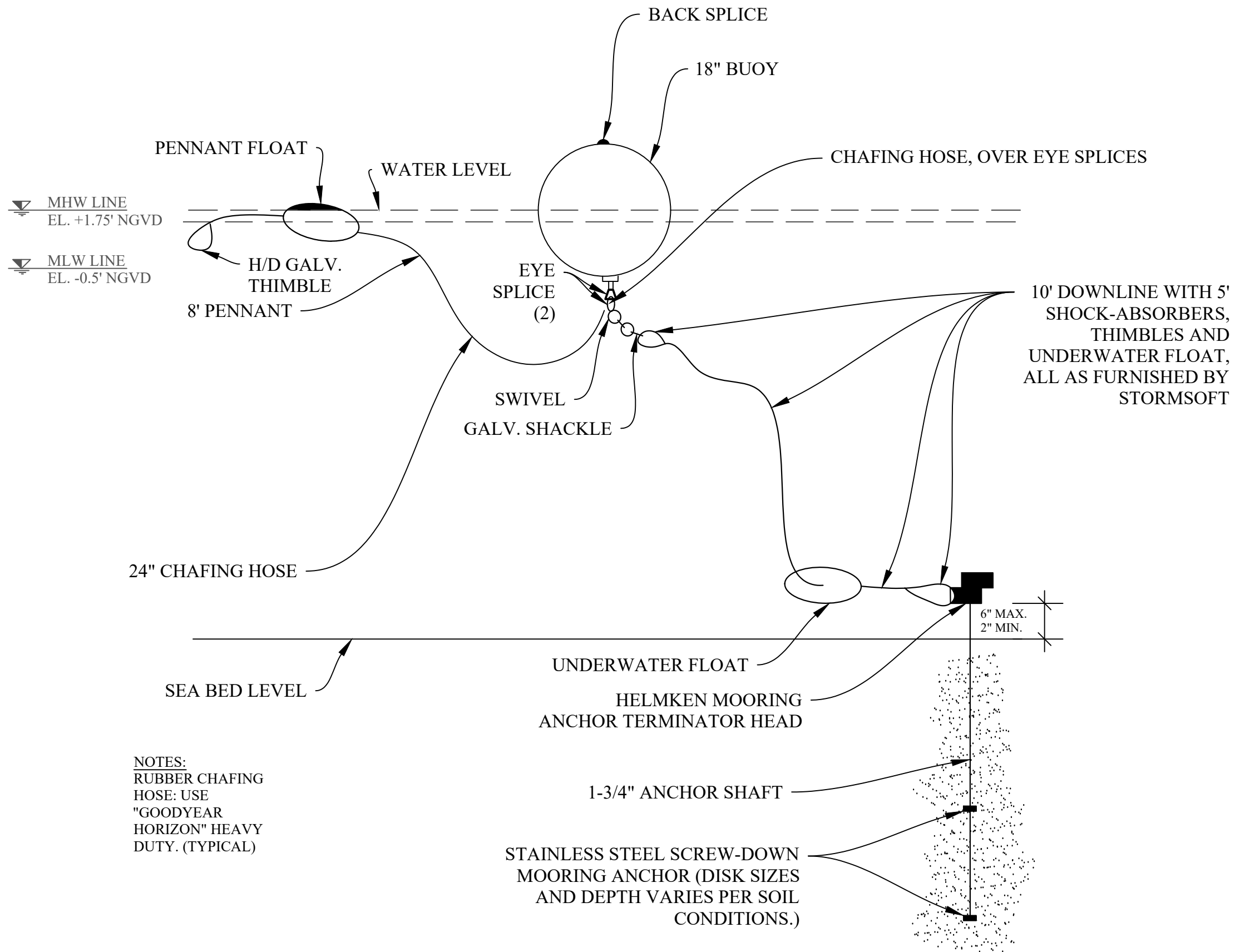
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**MOORING SYSTEM  
DETAIL**

SCALE : AS SHOWN  
SHEET NO.

**S-4**



NOTES:  
RUBBER CHAFING  
HOSE: USE  
"GOODYEAR  
HORIZON" HEAVY  
DUTY. (TYPICAL)

**MOORING SYSTEM DETAILS**

N.T.S.

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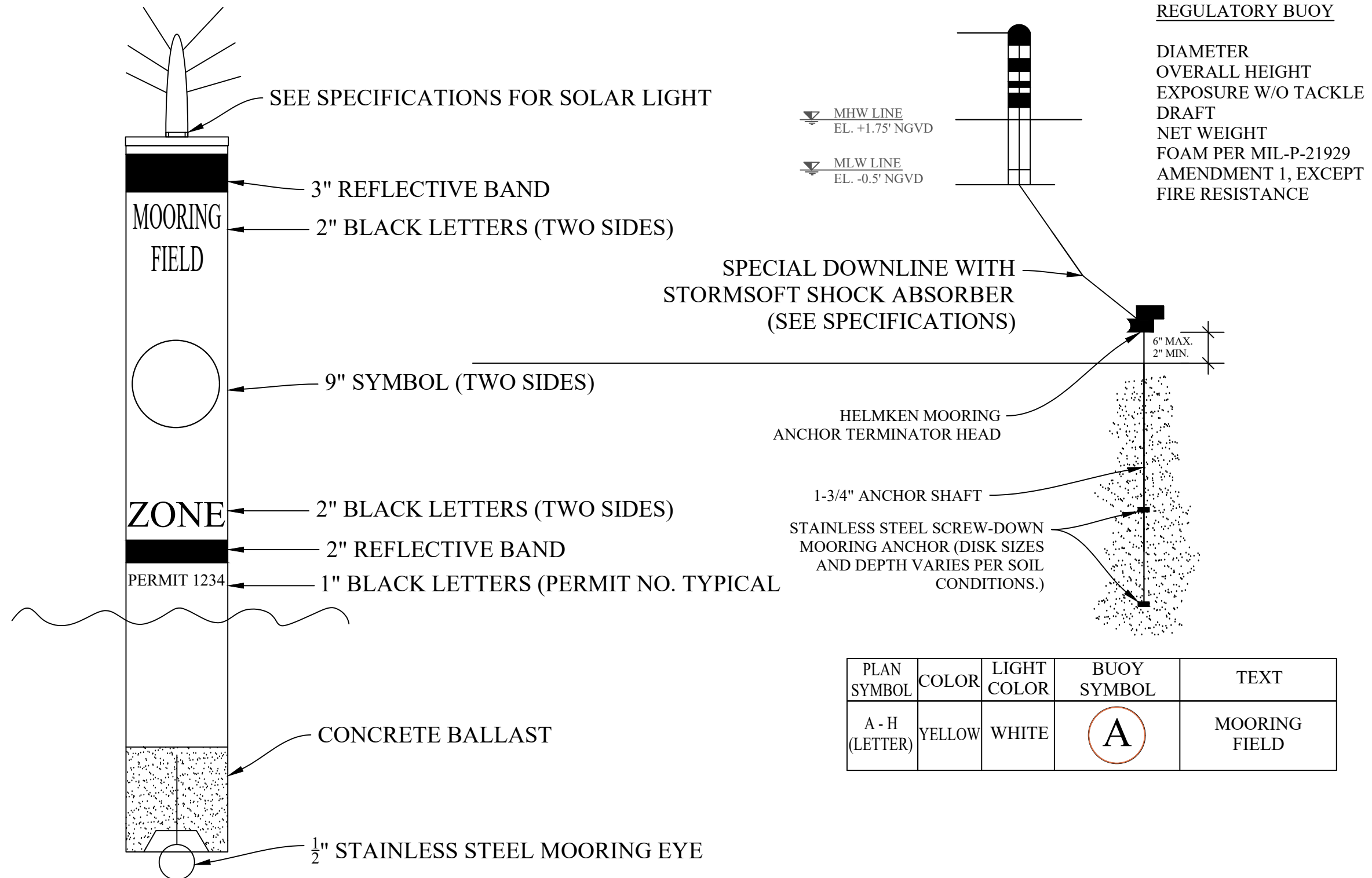
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**REGULATORY BUOY  
DETAIL**

SCALE : AS SHOWN  
SHEET NO.

**S-5**



PLAN SYMBOL	COLOR	LIGHT COLOR	BUOY SYMBOL	TEXT
A - H (LETTER)	YELLOW	WHITE		MOORING FIELD

**REGULATORY BUOY DETAILS**  
N.T.S.

**SCOPE OF WORK:**

The project contemplated for completion via this contract is the construction of the Resorts World Miami Marina.

All construction is to occur within Biscayne Bay between Watson, Hibiscus, Palm and San Marina Islands. All mooring field construction will be on City and State-owned submerged lands. All work shall be in accordance with general and specific conditions of permits issued for the project by the City of Miami, the Miami-Dade County Department of Regulatory and Economic Resources, the South Florida Water Management District, the Florida Fish and Wildlife Conservation Commission and the US Army Corps of Engineers. These permits and associated conditions are made a part of this contract.

The Mooring Fields are to be Standard Mooring Units manufactured, delivered and installed as specified.

The mitigation site is to be comprised of 224 moorings and 8 information buoys with solar powered lights.

**TIME TO COMPLETE:**

The contractor is to occupy each and all of the mooring anchor sites within 3 weeks following the Notice to Proceed and determine the type and length of embedment anchor for that particular mooring site in order to place the order with the anchor supplier for manufacturing to commence. It is anticipated that anchor manufacturing may take up to three months for completion.

While the mooring units are being manufactured, the contractor shall proceed with the installation of the information buoys around mooring field.

Once the mooring anchors have been manufactured and delivered, the contractor is to notify the City of his intention to re-mobilize to the site and commence construction of the mooring unit within two weeks.

It is expected that the mooring units anchor installations shall proceed at a average rate of 35 units per full work week. The installation of the mooring buoys is to be completed within 8 weeks following delivery of said mooring buoy anchors, the first week of said time is for mobilization. Mooring unit anchor manufacture shall be scheduled to accommodate this order and rate of construction.

The project is to provide completed functioning systems in place and able to meet the intended objectives. The cost(s) for any item(s) for which a unit price is not provided shall be included in the most appropriate bid item provided.

**STANDARD MOORING UNIT:**

The basis of payment for construction of the vessel moorings within a proposed mooring field is the standard mooring unit (Ea) with all specified components being provided, assembled and installed.

The major components that comprise a standard mooring unit are the auger anchor, downline, buoy and pennant. The general configuration of the unit, after assembly and installation, shall be as shown in the section views.

The specifications for each of the components are discussed in separate sections.

**STANDARD MOORING UNIT EMBEDMENT AUGER ANCHOR SPECIFICATION:**

The anchor for the mooring buoys shall be the Helmken embedment auger type anchor as provided by StormSoft Mooring Systems or approved equal.

The anchor shall be capable of resisting a minimum extraction loading of 18,000 pounds for not less than three minutes.

The anchor head shall be secured to the anchor and securely retain the downline with freedom for the specified swivel, downline, buoy and moored vessel to rotate around the vertical axis of the anchor.

Anchor manufacturing technical specifications are as follows:

Material: 1530 Modified per ASTM A-576

Carbon	.28 - .34
Manganese	1.4 - 1.6
Vanadium	.16 - .18
Niobium	.04 - .05
Chromium	.20 Max
Molybdenum	.80 Max

Weld Process GMAW w/ ER 705-3 AWS A 5.18  
Solid Wire  
Corrosion Protection Hot dip galvanizing per ASTM A153

**HELMKEN MOORING ANCHOR TERMINATION HEAD:**

Standard fitting to terminate the anchor hub as provided by suppliers of Helmken Rock Cutting anchors.

Anchor Types: Two anchor types are listed for use in each of two applications as determined for each specific mooring unit installation site. These two general anchor types are (1) Helmken rock cutting anchor and (2) sand/mud anchor.

**Helmken Rock Cutting Anchor:**

The anchor shall be capable of penetrating the rock underlying the seabed.

Hub 1-3/4" RCSQ x 120"

Auger Helix Blade: 3/8" by 6" with a rock cutting capability; 2 blades per anchor.

Blade material: ASTM A36 Modified	
Carbon	.20 - .33
Manganese	.30 Min

**Sand/Mud Anchor:**

The anchor shall be capable of providing extraction loading resistance, as required, using the existing bottom soils underlying the site seabed.

Hub 1-3/4" RCSQ x 84"

Auger Helix Blade: Triple blades, 3/8" by various diameters - 8", 10" or 12", minimum, as required by site conditions.

Blade material: ASTM A36 Modified	
Carbon	.20 - .33
Manganese	.30 Min

**Anchor Extensions:**

Anchor penetration into the sea floor shall be advanced sufficiently to achieve the required extraction loading restraint (18,000 pounds for three minutes) whether in rock or sand/mud. Where the required restraint has not been achieved by full penetration of the basic anchor unit, the unit penetration shall be advanced further in three foot increments utilizing anchor extension units comprised of mating fittings at the upper and lower ends to attach to the upper end of the anchor and the lower end of an additional extension, or if sufficient restraint has been achieved, the Helmken Mooring Anchor Termination fitting. The extension hubs shall be of the same materials as the basic anchor unit.

**Standard Mooring Unit StormSoft Downline:**

Each standard mooring unit, as available from StormSoft, shall be provided with a downline of 1-1/4" by 10' overall length, between two heavy duty, galvanized, steel integral thimbles spliced as terminal fittings, a 5' length of StormSoft rubber shock absorber and a heavy duty underwater float.

- 1-1/4" braided high-strength polyester that does not absorb water and retains 100% of its dry, 18,000 (minimum) pound breaking, strength.

- 5 feet section of rubber shock absorber that is industrial rubber multi-strand cords that allow limited stretch to absorb shock loads created by storms, surge and boat wakes.

- Heavy duty, underwater float to keep downline off the seafloor.

- 1" heavy duty galvanized steel thimbles (2) Standard Mooring Unit Buoy

- 18" spherical, white PVC, with blue reflective stripe 1" through hole. Either EMI 18" Buoy or Carolina Waterworks Buoy or approved equal.

The buoy shall be provided with a through-buoy line consisting of a 1" 3-strand polyline affixed at the upper end of the 1" through buoy hole with a block splice and an eye-splice the eye of which shall be chafe guarded with red 1" Goodyear Horizon Rubber chafing hose.

**Standard Mooring Unit Fittings:**

Shackle 7/8" galvanized screw pin shackle

Thimble 1" galvanized steel thimble as provided from StormSoft as part of the downline.

Swivel 1" galvanized eye-to-eye steel swivel

Standard Mooring Unit Pennant (Pick up line)

1" three strand nylon line 8 feet long between eye splice ends. The vessel end is to be eye-spliced around a 1" nylon Seadog thimble The pennant float is to be kept in place as close as practicable to the nylon thimble by one strand of nylon as a stop below the float. The lower end of the of the pennant is to be eye-spliced through the upper eye of the swivel by passing through red Goodyear Horizon chafing hose. 24 inches of red Goodyear chafing hose is to run up from this lower eye-splice to guard against chafe from the swivel and shackles.

Hazardous warning or information buoy unit anchor and down line:

The basis of payment for hazardous warning or information buoy units is to provide and install a complete unit of buoy, solar light, downline anchor and fittings, as shown in S-5, and specified as follows.

The hazardous warning and information buoys are to be the Ocean Spar 9 inch Dia by 80 inch Length as manufactured by Roylan with stainless steel fitting. The solar light is to be the one-mile amber or white light by Roylan with the flash pattern to be varied from buoy to buoy around the field as specified in the plans.

The anchor is to be a 1-1/4" round shaft of 5-1/2 feet in length with a 3/8" x 6" dia disk helix for embedment into rock or a 3/8" by 8" dia helix disk for embedment into sand/mud.

The downline is to be 5/8" StormSoft down line of length equal to the specific buoy site mean high water depth plus 2 feet with a 5/8" galvanized thimble eye-spliced into the lower (anchor) end and a 7/8" stainless-steel thimble eye-spliced into the upper (buoy) end.

The buoy is to be secured to the downline using a 7/8" stainless steel shackle.

**"Or Equal" Approvals Criteria:**

The Watson Island Mooring Field project proposes to achieve specific objectives relating to environmental improvements and proper vessel management. Mooring field project experiences elsewhere in Florida utilizing embedment anchors and associated mooring system components have demonstrated that these important project objectives can only be achieved by careful selection of system components that are manufactured, assembled and installed under specific constraints to meet these objectives.

**The objectives are:**

1. To provide vessel moorings without collateral damage to site submerged aquatic resources whether by impact or shading. Mooring system technology is to restrain each vessel on a minimum mooring swing radius.
2. To provide 18,000 pounds of anchor pull out restraint for three minutes minimum during storms utilizing system shock absorber technology within its components.
3. To be compatible with on-going vessel traffic in the project area.
4. To facilitate the operation and management of a large assemblage of vessels moored in close proximity and provide pumpout servicing as well as policing and other security activities.
5. To facilitate periodic inspections, maintenance and repairs to maintain capabilities to meet the objectives, as required, at the outset of a storm.

The specified minimum requirements for bidder-contractor qualifications must be met without exception to insure mooring units are installed by experienced, fully qualified and insured personnel using the appropriate equipment.

The mooring unit components have been carefully designed and selected as they are known by experience to meet these project objectives.

Any request for an "Or Equal" determination must be submitted with clear evidence that the requested substitution meets the overall project objectives without question.

The City of Miami reserves the right to accept or reject requests for "Or Equal" substitution at its sole discretion.

**GENERAL NOTES:**

1. Survey Information by Exacta Commercial Land Surveyors, Ocean Consulting, and SeaGrove Consultants
2. Elevation datum: MLW
3. Lat/Long Reference, NAD-83
4. See instructions to Bidders concerning Staging Area.
5. Resorts World Miami is responsible for removal of vessels and bottom debris following installation of regulatory and information buoys using third party contractor forces.
6. Contractor fully responsible for protection of seagrasses, manatee and other environmental resources in strict conformance to the permit conditions.

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**GENERAL NOTES**

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SHEET NO.

S-6

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**REGULATORY BUOY/MOORING AREA COORDINATE TABLE**  
STATE PLANE, NAD 83, FLORIDA EAST - 0901

POINT	NORTHING	EASTING	LATITUDE / LONGITUDE	POINT	NORTHING	EASTING	LATITUDE / LONGITUDE
1	529170.0267	928799.6879	N25° 47' 22.60" / W80° 10' 28.68"	21	528425.0267	928869.6879	N25° 47' 10.30" / W80° 10' 27.49"
2	529170.0267	929069.6879	N25° 47' 22.60" / W80° 10' 23.75"	22	528425.0267	929069.6879	N25° 47' 10.30" / W80° 10' 23.84"
3	529170.0267	929339.6879	N25° 47' 22.60" / W80° 10' 18.83"	23	528425.0267	929269.6879	N25° 47' 10.30" / W80° 10' 20.19"
4	529170.0267	929619.6879	N25° 47' 22.60" / W80° 10' 13.73"	24	528425.0267	929589.6879	N25° 47' 10.30" / W80° 10' 14.36"
5	529170.0267	929904.6879	N25° 47' 22.60" / W80° 10' 08.53"	25	528425.0267	929739.6879	N25° 47' 10.30" / W80° 10' 11.62"
6	529170.0267	930189.6879	N25° 47' 22.60" / W80° 10' 03.33"	26	528425.0267	929889.6879	N25° 47' 10.30" / W80° 10' 08.89"
7	528990.0267	928934.6879	N25° 47' 19.62" / W80° 10' 26.24"	27	528425.0267	930039.6879	N25° 47' 10.30" / W80° 10' 06.15"
8	528990.0267	929204.6879	N25° 47' 19.62" / W80° 10' 21.31"	28	528305.0267	928769.6879	N25° 47' 08.33" / W80° 10' 29.32"
9	528990.0267	929762.1879	N25° 47' 19.62" / W80° 10' 11.15"	29	528305.0267	929169.6879	N25° 47' 08.33" / W80° 10' 25.68"
10	528990.0267	930047.1879	N25° 47' 19.62" / W80° 10' 05.95"	30	528305.0267	929169.6879	N25° 47' 08.33" / W80° 10' 22.03"
11	528725.0267	928754.6879	N25° 47' 15.26" / W80° 10' 29.55"	31	528305.0267	929369.6879	N25° 47' 08.33" / W80° 10' 18.38"
12	528725.0267	929054.6879	N25° 47' 15.26" / W80° 10' 24.08"	32	528305.0267	929664.6879	N25° 47' 08.33" / W80° 10' 13.00"
13	528725.0267	929354.6879	N25° 47' 15.26" / W80° 10' 18.61"	33	528305.0267	929814.6879	N25° 47' 08.33" / W80° 10' 10.27"
14	528725.0267	929604.6879	N25° 47' 15.26" / W80° 10' 14.05"	34	528305.0267	929964.6879	N25° 47' 08.33" / W80° 10' 07.54"
15	528725.0267	929854.6879	N25° 47' 15.26" / W80° 10' 09.49"	35	528185.0267	928869.6879	N25° 47' 06.34" / W80° 10' 27.51"
16	528725.0267	930104.6879	N25° 47' 15.26" / W80° 10' 04.93"	36	528185.0267	929069.6879	N25° 47' 06.34" / W80° 10' 23.87"
17	528575.0267	928904.6879	N25° 47' 12.77" / W80° 10' 26.83"	37	528185.0267	929269.6879	N25° 47' 06.34" / W80° 10' 20.22"
18	528575.0267	929204.6879	N25° 47' 12.77" / W80° 10' 21.36"	38	528185.0267	929589.6879	N25° 47' 06.34" / W80° 10' 14.39"
19	528575.0267	929729.6879	N25° 47' 12.77" / W80° 10' 11.79"	39	528185.0267	929739.6879	N25° 47' 06.34" / W80° 10' 11.65"
20	528575.0267	929979.6879	N25° 47' 12.77" / W80° 10' 07.23"	40	528185.0267	929889.6879	N25° 47' 06.34" / W80° 10' 08.92"

**PERMIT DRAWINGS**

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PROJECT: 18-8105

MOORING BOUY  
POSITION COORDINATE  
TABLE

SCALE : AS SHOWN  
SHEET NO.

**S-7A**

**WATSON ISLAND  
MOORING FIELD  
PROJECT**  
Miami Beach, Florida

CLIENT:  
**CITY OF MIAMI**  
3500 Pan American Blvd.  
Miami, FL 33131

ENVIRONMENTAL CONSULTANT:  
**OCEAN  
CONSULTING, LLC**  
340 Minorca Avenue, Suite 7  
Coral Gables, Florida 33134  
Tel: (305) 921-9344  
Fax: (305) 677-3254

CONTRACTOR:

PROJECT ENGINEER:  
**DYNAMIC ENGINEERING  
SOLUTIONS, INC.**  
351 S. Cypress Road, Suite 303  
Pompano Beach, FL 33060  
Office - 954-545-1740  
Fax - 954-545-1721

SEAL / SIGNATURE / DATE

**PERMIT DRAWINGS**

**Issue # Issue Date**  
① August 23, 2018

PROJECT: 18-8105

MOORING BUOY  
POSITION COORDINATE  
TABLE - CONTINUED  
SCALE : AS SHOWN  
SHEET NO.

**S-7B**

**REGULATORY BUOY/MOORING AREA COORDINATE TABLE**  
STATE PLANE, NAD 83, FLORIDA EAST - 0901

POINT	NORTHING	EASTING	LATITUDE / LONGITUDE	POINT	NORTHING	EASTING	LATITUDE / LONGITUDE
41	528070.0267	906878.2100	N25° 47' 04.45" / W80° 10' 29.62"	71	527555.0267	929039.6879	N25° 46' 95.92" / W80° 10' 24.49"
42	528070.0267	928880.6879	N25° 47' 04.45" / W80° 10' 27.33"	72	527555.0267	929129.6879	N25° 46' 95.92" / W80° 10' 22.85"
43	528070.0267	929006.6879	N25° 47' 04.45" / W80° 10' 25.03"	73	527555.0267	929219.6879	N25° 46' 95.92" / W80° 10' 21.20"
44	528070.0267	929132.6879	N25° 47' 04.45" / W80° 10' 22.73"	74	527555.0267	929309.6879	N25° 46' 95.92" / W80° 10' 19.56"
45	528070.0267	929258.6879	N25° 47' 04.45" / W80° 10' 20.43"	75	527555.0267	929399.6879	N25° 46' 95.92" / W80° 10' 17.92"
46	528070.0267	929384.6879	N25° 47' 04.38" / W80° 10' 18.14"	76	527555.0267	929589.6879	N25° 46' 95.92" / W80° 10' 14.46"
47	528070.0267	929579.6879	N25° 47' 04.38" / W80° 10' 14.58"	77	527435.0267	929039.6879	N25° 46' 93.94" / W80° 10' 24.50"
48	528070.0267	929698.1905	N25° 47' 04.38" / W80° 10' 12.42"	78	527435.0267	929129.6879	N25° 46' 93.94" / W80° 10' 22.86"
49	528070.0267	929816.6931	N25° 47' 04.38" / W80° 10' 10.26"	79	527435.0267	929219.6879	N25° 46' 93.94" / W80° 10' 21.22"
50	528070.0267	929935.1957	N25° 47' 04.38" / W80° 10' 08.10"	80	527435.0267	929309.6879	N25° 46' 93.94" / W80° 10' 19.58"
51	527950.0267	928889.6879	N25° 47' 02.45" / W80° 10' 27.18"	81	527435.0267	929399.6879	N25° 46' 93.94" / W80° 10' 17.94"
52	527950.0267	929013.4379	N25° 47' 02.45" / W80° 10' 24.92"	82	527435.0267	929589.6879	N25° 46' 93.94" / W80° 10' 14.47"
53	527950.0267	929137.1879	N25° 47' 02.45" / W80° 10' 22.66"	83	527315.0267	929039.6879	N25° 46' 91.96" / W80° 10' 24.51"
54	527950.0267	929260.938	N25° 47' 02.45" / W80° 10' 20.41"	84	527315.0267	929129.6879	N25° 46' 91.96" / W80° 10' 22.87"
55	527950.0267	929384.688	N25° 47' 02.45" / W80° 10' 18.15"	85	527315.0267	929219.6879	N25° 46' 91.96" / W80° 10' 21.23"
56	527950.0267	929579.6879	N25° 47' 02.45" / W80° 10' 14.60"	86	527315.0267	929309.6879	N25° 46' 91.96" / W80° 10' 19.59"
57	527950.0267	929689.6879	N25° 47' 02.45" / W80° 10' 12.59"	87	527315.0267	929399.6879	N25° 46' 91.96" / W80° 10' 17.95"
58	527950.0267	929799.6879	N25° 47' 02.45" / W80° 10' 10.58"	88	527315.0267	929589.6879	N25° 46' 91.96" / W80° 10' 14.49"
59	527950.0267	929909.6879	N25° 47' 02.45" / W80° 10' 08.58"	89	527195.0267	929039.6879	N25° 46' 89.98" / W80° 10' 24.53"
60	527820.0267	929034.6879	N25° 47' 00.29" / W80° 10' 24.55"	90	527195.0267	929129.6879	N25° 46' 89.98" / W80° 10' 22.89"
61	527820.0267	929209.6879	N25° 47' 00.29" / W80° 10' 21.36"	91	527195.0267	929219.6879	N25° 46' 89.98" / W80° 10' 21.25"
62	527820.0267	929384.688	N25° 47' 00.29" / W80° 10' 18.17"	92	527195.0267	929309.6879	N25° 46' 89.98" / W80° 10' 19.60"
63	527820.0267	929579.6879	N25° 47' 00.29" / W80° 10' 14.61"	93	527195.0267	929399.6879	N25° 46' 89.98" / W80° 10' 17.96"
64	527820.0267	929684.6879	N25° 47' 00.29" / W80° 10' 12.70"	94	527195.0267	929589.6879	N25° 46' 89.98" / W80° 10' 14.50"
65	527820.0267	929789.6879	N25° 47' 00.29" / W80° 10' 10.78"	95	527075.0267	929039.6879	N25° 46' 88.00" / W80° 10' 24.54"
66	527690.0267	929034.6879	N25° 46' 98.15" / W80° 10' 24.56"	96	527075.0267	929129.6879	N25° 46' 88.00" / W80° 10' 22.90"
67	527690.0267	929209.6879	N25° 46' 98.15" / W80° 10' 21.37"	97	527075.0267	929219.6879	N25° 46' 88.00" / W80° 10' 21.26"
68	527690.0267	929384.688	N25° 46' 98.15" / W80° 10' 18.18"	98	527075.0267	929309.6879	N25° 46' 88.00" / W80° 10' 19.62"
69	527690.0267	929579.6879	N25° 46' 98.15" / W80° 10' 14.63"	99	527075.0267	929399.6879	N25° 46' 88.00" / W80° 10' 17.98"
70	527690.0267	929684.6879	N25° 46' 98.15" / W80° 10' 12.71"	100	527075.0267	929589.6879	N25° 46' 88.00" / W80° 10' 14.51"