December 15, 2014

Beatty Development Group
1300 Thames Street, Suite 10
Baltimore, MD 21231

Attention: Mr. Jonathan Flesher

Re: Plaza Garage Concentric Pile Work Plan – RTC from EPA
Exelon Tower and Plaza Garage
Baltimore, Maryland
MRCE File No.11896A

Gentlemen:

A proposed Plaza Garage Concentric Pile Work Plan prepared by the contractor was previously submitted for review to the United States Environmental Protection Agency (USEPA) and Maryland Department of the Environment (MDE). The plan was returned with general comments and questions regarding drilling methods, air monitoring logistics, and materials handling procedures. A copy of the comments is attached. The following general response to the comments was developed with the contractor and ERM.

Concentric Pile Obstruction Probing Work Plan

A majority of concentric pile locations have a low probability of obstructions. Locations of moderate probability (approximately 15 locations) and high probability (approximately 15 locations) were identified. The means and methods developed by Armada Hoffler provide a drilling-based method for obstruction probing and demolition. A principle benefit of this plan is that it reduces the size of excavations by replacing open excavation with dry auger and wet coring methods. This plan adds an alternate to the currently accepted Detailed Development Plan (December 2013), specifically Sections 5.1.3 – Obstruction Removal and 6.2.2 – Foundation Penetrations and Repair and subsequent Minor Modifications (March and July 2014); the approved Materials Handling and Management Plan (December 2013), and Construction Air Monitoring Plan (CAMP, March 2014). All previously approved plans will continue to be used to support the proposed means and methods, except where specifically indicated herein.
Attachments

Comments from USEPA on Initial Submittal
Drawing F1.31A and Detail 1A (Proposed Alternates)
Figure 5
Photo 1 – HDPE Dam Mockup
Equipment Data Sheets

Obstruction Probing (Drawing F1.31 Proposed Alternate, Panel 1A)

The plan proposes to use an 18 inch diameter single flight auger mounted on an excavator to drill through obstructions. Compressed air and wash water circulation will not be used to clear cuttings. The auger will be advanced through the Fill stratum to approximately Elev. +1 to confirm the absence of an obstruction. The auger will be extracted in a counterclockwise direction to return spoils to the subsurface and below the liner. Any spoils remaining in the HDPE pipe will be removed by hand before the pile is driven and managed in accordance with the Material Handling and Management Plan (MHMP) for the project.

If an obstruction is encountered which the auger cannot advance through without deviating from the plan location, an 18 inch core barrel will be used to cut and remove the obstruction. Water will be applied to the core bit at the base of the drill string to cool the cutting teeth. The water will be pumped through the drill rods. Drill water will not be allowed to rise to the top of the HDPE pipe, it will be removed and handled as contact water in accordance with the MHMP. Periodically, the core barrel will be removed from the hole and core spoils will be deposited in a lined roll off located adjacent to the rig. Coring will continue until the obstruction is cleared. Drill water and spoils generated as part of coring will be managed in accordance with the MHMP for the project.

The rig, HDPE pipe, roll off container, areas between each, and all areas a minimum of 5 feet around each item will be covered in polyethylene plastic sheeting and secured with sandbags. A temporary soil berm will be constructed at the edges of the plastic as a contingency measure to contain materials. Upon completion, all plastic sheeting will be disposed off site in accordance with the MHMP. The roll off containers will be placed in temporary secondary containment (i.e., a collapsed-container) until removed from the site for proper off-site disposal.

Rig specifications and data sheets are attached.

Dust Suppression

Potable water will be used for dust suppression utilizing a portable water tank and pressure washer with a fine water spray nozzle to ensure that there are no fugitive dust emissions generated during auger or core drilling, as required. These procedures are consistent with the procedures used throughout the project for dust suppression as specified in the MHMP.

Work Zone Air Monitoring

Real-time particulate monitoring will be performed in accordance with the approved CAMP, specifically QAPP-Appendix D, Figure 5 (March 2014), as subsequently modified by the 25 September and 3 October 2014 letters received from EPA. Four single, concentric pile locations
will be grouped into one work zone approximately 60 feet by 60 feet (concentric pile locations are 30 feet apart on center), consistent with the spacing shown in Figure 5 (attached). As such, four work zone monitors at 90 degrees will be deployed for each work zone based upon the daily forecasted prevailing wind direction, upwind, downwind and crosswind. Only one concentric pile location will be probed at a time as there will only be one rig and crew performing this work.

**MMC Restoration (Drawing F1.31 Proposed Alternate, Panel 3)**

Upon completion of pile driving in locations where the HDPE pipe is the temporary liner dam, clean cover soil will be removed and the permanent dam will be installed. The capillary break area disturbed by probing and/or pile driving will be excavated and the MMC restored in accordance with DDP Drawings F1.30 and F1.31. Testing and QA/QC requirements remain as shown on Drawing F1.03.

**Summary**

The proposed modification, which reduces the area of liner removed for obstruction removal, is intended to reduce exposure and volume removed from below the MMC. The HDPE pipe serves three functions: temporary liner dam, isolation casing for contaminated spoils and water, and reduced area of geomembrane cut. There are several environmental benefits from the proposed work plan, including reduced volume of waste generated, reduced truck traffic for disposal, reduced potential for particulate emissions, and reduced worker exposure.

Very truly yours,

**MUESER RUTLEDGE CONSULTING ENGINEERS**

By: ________________

Peter W. Deming, P.E.
Extrusion weld HDPE pipe with pre-made boot a minimum of 6 inches inboard of Location C. Cover exposed geomembrane with Cover Geotextile. Backfill around perimeter with cover soil to existing grade. Restore warning layer as necessary.

Probe for obstructions with auger drill. Collect spoils and handle in accordance with the MHMP.

Remove obstructions as shown on Panel 1A.

HDPE Pipe, 3ft I.D., top 6 in min above existing grade

Select Granular Fill (typical)

1. Remove polyethylene plastic and re-excavate cover soil:
   a. Excavate cover soil, use hand tools within 6 inches of working face if necessary, and remove diaphragm.
   b. Drive diaphragm through concrete, if present, and remove as necessary.
   c. Place high-strength concrete.
   d. Lay sleeve, flush with HDPE pipe.

Deleted, see Plaza Garage Work Plan.

Deleted, see Plaza Garage Work Plan.

Deleted, see Plaza Garage Work Plan.

Construct brace cap.
Figure 5
Response Actions and Notifications to Action Level Exceedances
MOBILE STATIONS (★)
(Westerly Wind Direction Example)
1. Use in locations where an obstruction is encountered with auger bit. Place polyethylene plastic over working area.
Re-survey pile location; use offsets as necessary to verify location.

2. Install temporary steel isolation casing to a minimum of 12 inches below capillary break stone to prevent raveling and fouling of in-place capillary break.

3. Drill 18” diameter hole to clear obstruction. Apply water to control dust and cool drill bit as necessary. Extract spoils and deposit in container placed on polyethylene plastic. Handle materials in accordance with BMP.

4. Place cover over hose pipe when not being worked on.
Photo 1 - HDPE Dam Mockup
Equipment Data Sheets
Bohrgeräte für HDI-Einsätze und Vernagelungen

**KR 401-1**
- Einsatzgewicht: 10,0 t
- Antriebsleistung: 86 kW / 118 hp
- Haupthydraulikkreise: 2x96 l/min

**KR 712**
- Einsatzgewicht: 21,0 t
- Antriebsleistung: 181 kW / 248 hp
- Haupthydraulikkreise: 1x430 l/min (load-sensing)
- Bohrtiefe: max. 20 m

Lafette 140
- Gesamtlänge: 6200 mm
- Verfahrweg Schlitten: 4500 mm
- Andruckkraft bei 200 bar: 23 kN
- Vorschub: 13,0 m/min

Pumpen und Mischanlagen für Verankerungs- und Injektionstechnik im Niederdruck- und Hochdruckbereich

In unserem Standardprogramm finden Sie:

- Chargen- Suspensions- mischanlagen
  - Volumen: 1,0 - 2,5 m³
  - Mischleistung: 10 - 15 - 20 - 30 m³/h

- Misch- container
- Mixing and batching plant

**Injektionsanlagen**
- Förderleistung: output rate 60 - 180 dm³/min
- Förderdruck: output pressure 100 - 120 bar

**Schlauchpumpen**
- Förderleistung: output rate 60 - 180 dm³/min
- Förderdruck: output pressure 100 - 120 bar
**KR 712-1 // Specifications**

**Motor**
- Diesel engine, water cooled
- Deutz TCD 2013 L6 2V
- EEC 97/68 EC Stage 3A
- USA EPA / CARB ANIMAL 3
- 173/2300 kW / r / min (DIN ISO 3046)
- Diesel tank 400 l

**Hydraulic system**
- Hydraulic pumps
  - First cycle
    - load-sensing 270 l / min
  - Second cycle
    - load-sensing 270 l / min
  - 3rd cycle
    - load-sensing 65 l / min
  - Fourth cycle
    - 30 l / min
  - Fifth circuit
    - 20 l / min
- Hydraulic tank 600 l
- System pressure 330 bar

**Undercarriage (Tele)**
- Drive FL 6
- Force max. 210/105 kN
- Travel speed max. 1.77 / 3.54 km / h
- Total width 2500 mm
- telescopic 2500 - 3700 mm
- 3-grouser shoes 500 mm
- Length of the undercarriage 4270 mm
- esp. Ground pressure 6 - 8 N / cm

**Undercarriage (rigid)**
- Drive FL 6
- Force max. 210/105 kN
- Driving speed 1.77 / 3.54 km / h
- Total width 3000 mm
- 3-grouser shoes 600 mm
- Ground clearance 450 mm
- Length of the undercarriage 3545 mm
- esp. Ground pressure 5-7 N / cm

**Drill mount type 313/10 with 2-stage feed drive**
- permissible torque (max.) 32 kNm
- Total length (max.) 14800 mm
- Rod length 12000 mm
- Feed force 130/65 kN
- Retraction force 130/65 kN
- Feed rate 9.9 / 19.8 m / min
- Withdrawal speed 9.9 / 19.8 m / min
- Advancing rapidly 21.0 / 42.0 m / min
- Retreat quickly 21.0 / 42.0 m / min

**Hydraulic Hammer**
- recommended KD 1624 R, 1828 R KD

**Rotary drive** (only for vertical drilling, filing, without frame)
- recommended KH 16, KH 27, KH 43

**HDI**
- recommended KH 12 SK, 3x3 m lattice tower
- Depth / drill diameter (max.) 20 m / 133 mm
- Drop the gun carriage without linkage

**Winch**
- Traction 10 kN
- Cable outlet 800 mm
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<th>Value</th>
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**Drill mount type 316 with 2-stage feed drive**

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<td>Rod length (max.)</td>
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<td>Feed rate</td>
<td>7.8 / 15.6 m / min</td>
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<td>Withdrawal speed</td>
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<tr>
<td>Advancing rapidly</td>
<td>16.5 / 33 m / min</td>
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<tr>
<td>Retreat quickly</td>
<td>16.5 / 33 m / min</td>
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**Rotary drive (only for vertical drilling, filing, without frame)**

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**Winch**

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<tr>
<td>Cable outlet</td>
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**Weight**

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<tr>
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<td>23-25 t — 50,000 LB's</td>
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The Model 3100CM (HP) was developed in conjunction with Atlantic Caisson Corporation of Glen Rock, Pennsylvania. The Model 3100CM (HP) is a new version of Watson's Model 3100 and incorporates a 60,000 lb crowd system to address the need for a high performance foundation drilling machine to meet challenging rock conditions.

SPECIFICATIONS

CAPACITY:
- Typical hole diameters: 48" (122cm) — 96" (244cm)
- Maximum hole diameter: 108" (274cm)
- Hole depth: to 120' (36.6m)

PERFORMANCE:
- Torque: 113,000 lb ft (153,680Nm)
- Hoist: 25,000 lbs (111kN)
- Crowd: 60,000 lbs (267kN) + (see reference chart at right)

CHARACTERISTICS:
- Power unit: Cummins diesel, Model 6CT8.3 liter, 201 hp
- Transmission: Clark powershift
- Rotary: Double reduction style
- Kellys: 8" outer/6" solid inner
- Hoist: Watson crane type hoist with controlled freefall on both inner kelly hoist and freeline. Hoist installation includes a hydraulic power up/power down feature
- Crowd system: crowd force is initiated in the outer kelly operating cylinder located in the derrick structure. Through a system of cable reaving, crowd force pulls down on the outer kelly applying positive crowd to the tool. A special reaction jack installation is incorporated into the rotating frame structure. When activated, the crowd force is balanced to provide maximum production while insuring a straight hole.
Model 3100CM

Dimensions for standard 80' drill depth crawler based drill unit.

Approximate assembled unit weight: 87,000 lbs

Unit width is 11' 11"

12' 5" Track toe to centerline of kelly bar, slide out is 62"
Slide travel is 60"

Dimensions in feet and inches
WATSON 3100
S/N – 08
S/N – 43
S/N – 56

WEIGHTS:

- TRANSPORT WEIGHT
  LOWER UNIT – 65,000 LBS.
  DERRICK – 26,000 LBS.

DIMENSIONS:

- TRANSPORT HEIGHT
  12’ 4” FROM GROUND TO TOP OF PICKING EYE ON CAB
- TRANSPORT WIDTH
  11’ 11”
- TRANSPORT LENGTH
  24’ (LOWER UNIT ONLY)
- OVERALL LENGTH OF DERRICK
  55’ 5”
- TOTAL OVERALL HEIGHT BOOMED UP
  63’
- MAX DRILLING DEPTH
  83’ (2 BAR KELLY)
  120’ (3 BAR KELLY)
WATSON 2500
S/N - 110

WEIGHTS:

- TRANSPORT WEIGHT
  69,660 Lbs.

DIMENSIONS:

- TRANSPORT HEIGHT
  12' 0'' (BOOMED DOWN)
- TRANSPORT WIDTH
  10' 0''
- TOTAL WIDTH
  TRACKS EXTENDED: 11' 11''
- TOTAL OVERALL LENGTH
  45'' (BOOMED DOWN)
- TOTAL HEIGHT
  51' 3'' (GROUND TO TOP OF MAST)
- MAX. DRILLING DEPTH
  63' (DEPENDING ON TOOL USED)
TEXOMA 700
S/N 1007197

WEIGHTS:

- TRANSPORT WEIGHT
  33,880 LBS.
  55,000 LBS-Cat
  Scaled 6/20/08

DIMENSIONS:

- TRANSPORT HEIGHT
  12’ 6”
- TRANSPORT WIDTH
  8’
- TRANSPORT LENGTH
  42’ 6”

WORKING DIMENSIONS:

- MAST UP
  33’ LONG
  51’ HIGH

MAX DRILLING DEPTH:

- 60’ + TOOL
**SPECIFICATIONS**

### ENGINE
- **Model:** Komatsu SAA6D114E-5
- **Type:** Water-cooled, 4-cycle, direct injection
- **Aspiration:** Turbocharged, aftercooled, cooled EGR
- **Number of cylinders:** 6
- **Bore:** 114 mm, 4.49"
- **Stroke:** 144.5 mm, 5.69"
- **Piston displacement:** 8.08 ltr, 540 in³
- **Horsepower:**
  - SAE J1995: Gross 202 kW, 271 HP
  - ISO 9240, SAE J1349: Net 192 kW, 257 HP
- **Rated rpm:** 1950
- **Fan drive method for radiator cooling:** Mechanical
- **Governor:** All-speed control, electronic
- **EPA Tier 4 Interim and EU stage 3B emissions certified**

### HYDRAULICS
- **Type:** Hydraulics (Hydraulic Mechanical Intelligence New Design) system, closed-center system with load sensing valves and pressure compensated valves
- **Number of selectable working modes:** 6
- **Main pump:**
  - **Type:** Variable displacement piston type
  - **Pumps for:** Boom, arm, bucket, swing, and travel circuits
  - **Maximum flow:** 535 ltr/min, 141.3 gal/min
  - **Supply for control circuit:** Self-reducing valve
- **Hydraulic motors:**
  - **Supply:** 37.3 MPa, 540 kg/cm², 5,400 psi
  - **Travel circuit:** 37.3 MPa, 540 kg/cm², 5,400 psi
  - **Swing circuit:** 27.9 MPa, 385 kg/cm², 4,050 psi
  - **Pilot circuit:** 3.2 MPa, 45 kg/cm², 470 psi
- **Hydraulic cylinders:**
  - **(Number of cylinders – bore x stroke x rod diameters):**
  - **Boom:** 2–140 mm x 1400 mm x 100 mm, 5.5" x 56.3" x 3.9"
  - **Arm:** 1–160 mm x 1825 mm x 110 mm, 6.3" x 71.9" x 4.3"
  - **Bucket:** 1–140 mm x 1285 mm x 100 mm, 5.5" x 50.6" x 3.9"
  - **(for 3.2 m 10'5" and 4.0 m 13'2" Arms):**
  - **Swing range:** 1–165 mm x 1235 mm x 110 mm, 5.9" x 50.6" x 4.3"

### DRIVING AND BRAKES
- **Steering control:** Two levers with pedals
- **Drive method:** Hydrostatic
- **Maximum drawbar pull:** 290 K, 20570 kg, 65,191 lb
- **Gradeability:** 70%, 35°
- **Maximum travel speed:**
  - High: 5.5 km/h, 3.4 mph
  - Mid: 4.5 km/h, 2.8 mph
  - Low: 3.2 km/h, 2.0 mph
- **Service brake:** Mechanical
- **Parking brake:** Mechanical disc brake

### SWING SYSTEM
- **Swing method:** Hydrostatic
- **Swing reduction:** Planetary gear
- **Swing circle lubrication:** Grease-bathed
- **Service brake:** Hydraulic lock
- **Holding brake/swing lock:** Mechanical disc brake
- **Swing speed:** 3.5 rpm
- **Swing torque:** 11386 kg.m, 82,313 ft lbs

### UNDERRCARRIAGE
- **Center frame:** X-frame
- **Track frame:** Box-section
- **Seal of track:** Sealed track
- **Track adjuster:** Hydraulic
- **Number of shoes (each side):** 48
- **Number of carrier rollers (each side):** 2
- **Number of track rollers (each side):** 8

### COOLANT & LUBRICANT CAPACITY
- **Fuel tank:** 665 ltr, 159.8 U.S. gal
- **Coolant:** 37 ltr, 9.7 U.S. gal
- **Engine:** 36 ltr, 9.2 U.S. gal
- **Final drive, each side:** 9.0 ltr, 2.4 U.S. gal
- **Swing drive:** 13.7 ltr, 3.6 U.S. gal
- **Hydraulic tank:** 105 ltr, 27.9 U.S. gal
- **Hydraulic system:** 365 ltr, 96.4 U.S. gal

### OPERATING WEIGHT (APPROXIMATE)
- **Operating weight includes:** 6500 mm 21'3" one-piece HD boom, 3185 mm 10'6" arm, SAE heaped 1.96 m³ 2.56 yd³ bucket, rated capacity of lubricants, coolant, full fuel tank, operator, and standard equipment.

<table>
<thead>
<tr>
<th>Triple-Grouser Shoes</th>
<th>Operating Weight</th>
<th>Ground Pressure</th>
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<tbody>
<tr>
<td>700 mm</td>
<td>35,496 kg</td>
<td>0.59 kg/cm²</td>
</tr>
<tr>
<td>26&quot;</td>
<td>78,265 lb</td>
<td>8.31 psi</td>
</tr>
<tr>
<td>800 mm</td>
<td>33,876 kg</td>
<td>0.59 kg/cm²</td>
</tr>
<tr>
<td>31.5&quot;</td>
<td>79,083 lb</td>
<td>7.40 psi</td>
</tr>
<tr>
<td>850 mm</td>
<td>36,255 kg</td>
<td>0.50 kg/cm²</td>
</tr>
<tr>
<td>33.5&quot;</td>
<td>79,930 lb</td>
<td>7.00 psi</td>
</tr>
</tbody>
</table>

### Component Weights
- **Arm including bucket cylinder and linkage:** 3185 mm 10'6" arm assembly: 1761 kg, 3,882 lb
- **4620 mm 13'2" arm assembly:** 1988 kg, 4,363 lb
- **One piece HD boom including arm cylinder:** 6500 mm 21'3" boom assembly: 3135 kg, 6,912 lb
- **Boom cylinders x 2:** 259 kg, 571 lb
- **Counterweight:** 7090 kg, 15,931 lb
- **1.96 m³ 2.56 yd³ bucket - 54" width:** 1654 kg, 3,625 lb
**Specifications**

**Upperstructure Engine**

Cummins GBT150 diesel, turbocharged, liquid cooled, 4 cycle, 6 cylinder, 359 cid (5.9L), 4.02" bore x 4.72" stroke (102mm x 120mm), 17:4:1 compression ratio.

150 hp (112kW) max gross at 2000 rpm, 148 hp (110kW) gross at engine gov. speed of 2200 rpm, 135 hp (101kW) net at 2500 rpm, 440 lb-ft (597 Nm) gross torque at 1600 rpm.

Altitude capability: 10,000' (3050m). Derate 4% per 1000' (305m) above 10,000' (3050m).

Maximum slope: 45°.

12 volt starter, 105 amp alternator, two SAE #C31-8 810CCA batteries, two-stage dry type air cleaner with centrifugal pre-filterer, ejector valve and service indicator, spin-on oil filter, spin-on fuel filter/water separator.

Fuel tank capacity: 65 gallons (246L).

**Hydraulic System**

**PUMPS**
- **Main** Two load sensing axial piston pumps, 0-60 GPM (0-227 L/min) each.
- **Swing** Axial piston pump, 0-16 GPM (0-61 L/min).
- **Auxiliary** Tandem gear pump for pilot control and cooling circuits, 20.6 GPM (78 L/min).

**SYSTEM MONITOR**

Electronic monitor in cab indicates low hydraulic fluid level, high hydraulic fluid temperature, and condition of return and suction filters.

**SYSTEM SPECIFICATIONS**

Four double acting cylinders:
- 2 boom hoist, 50' ID, 30' rod (17mm x 76mm), 2625 (657mm) stroke.
- 1 tilt: 5' ID, 30' rod (127mm x 76mm), 18775 (479mm) stroke.
- 1 telescope: 4' ID, 27.5' rod (127mm x 76mm), 1269 (321mm) stroke.

Four hydraulic motors:
- Swing, 63 hp (47kW): till, 26 hp (19.2kW); remote: 115 hp (86kW).

**Operating pressures**

- **Hoist** 3900 psi (26.67MPa)
- **Till** 3200 psi (22.19MPa)
- **Swing** 5700 psi (39.27MPa)
- **Tool** 4300 psi (29.92MPa)
- **Telescope** 3250 psi (22.63MPa)
- **Remote Prop** 3800 psi (26.38MPa)
- **Opt. Engine** 4200 psi (29.39MPa)
- **Pilot system** 480 psi (3.307MPa)

**Undercarriage**

- **6x4 or 6x6** Wheelbase: 171" (4.3m)
- **Frame width:** 42" (1070mm)
- **Cross vehicle axle weight rating:** 6 x 4 - 59,200 lb. (26,935 kg)
- 6 x 6 - 62,000 lb. (28,132 kg)

**Engine**

Cummins 8BTAA5.9 diesel, turbocharged and aftercooled, 4 cycle, 6 cylinder, 365 cid (5.9L), 4.02" bore x 4.72" stroke (102mm x 120mm) 200 hp (149kW) gross at 2500 rpm, 185 hp (138kW) net at 2500 rpm.

Throttle stop limited to 2500 rpm (hi-idle no load, 200 hp at 2200 rpm loaded) 600 lb-ft (814Nm) gross torque at 1500 rpm. Altitude capability: 9850' (3000m). Derate 4% per 1000' (305m) above 9850' (3000m).

**Option Engine**

Cummins 6CTA8.3 diesel, turbocharged and aftercooled, 245 hp (183kW) max gross at 2000 rpm, 230 hp (172kW) gross at engine gov. speed of 2200 rpm, 720 lb (976Nm) torque at 1500 rpm.

**Electrical System**

12 volt, 62 amp alternator with integral voltage regulator, Batteries: 2 SAE #C31-8 810CCA

**Cooling System**

- **Fin and tube-type radiator**: 6-blade 24" (610mm) fan with shroud.
- 8-blade fan with optional engine.

**Fuel System**

- 50 gallon (190L) fuel tank, spin-on fuel filter/water separator.

**Air Filter**

- Dry type with service indicator.

**Oil Filter**

- Full flow spin-on element.

**Governor**

- Mechanical.

**Undercarriage**

**Upperstructure Cab**

- All-weather cab with tinted safety glass windows, skylight, acoustical lining, four way adjustable operator's seat, filtered fresh air heater and defroster. Front window slides to overhead storage. Mirrors on both sides of machine.

**Controls**

- Two hydraulic joysticks (hoist & bucket, telescope & swing), one rocker switch (tilt) control upperstructure. Hydraulic joysticks mounted on arm rests, independently adjustable for individual operator comfort and convenience.

- Two foot pedals for hydraulic remote control of undercarriage climbing, travel and digging brakes.

- Joysticks and pedals are self-centering; when controls are released, power for movement disengages and swing and travel brakes set automatically.

**Engine controls**

- Key operated ignition/starter switch, throttle, hour meter and air cleaner condition indicator.
- Electronic monitor indicates fuel level, low battery charge, coolant level and lube oil pressure, high coolant temperature, and engine rpm.

**Swing**

- Independent closed loop swing circuit with axial piston pump and motor. Planetary transmission.

- Swing speed: 8.0 rpm.

- Swing brake
  - Automatic swing parking brake, spring-set hydraulic release. Dynamic braking provided by hydraulic system.
Shown with 8065-6001 48' (1.22m) excavating bucket

<table>
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<th>6 x 6</th>
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<tbody>
<tr>
<td>A 27' 11&quot; (8.5m)</td>
<td>27' 11&quot; (8.5m)</td>
</tr>
<tr>
<td>B 11' 10&quot; (3.6m)</td>
<td>12' 2&quot; (3.7m)</td>
</tr>
<tr>
<td>B1 10' 11&quot; (3.3m)</td>
<td>11' 4&quot; (3.4m)</td>
</tr>
<tr>
<td>C 18' 0&quot; (5.4m)</td>
<td>18' 0&quot; (5.4m)</td>
</tr>
<tr>
<td>C1 18' 0&quot; (5.4m)</td>
<td>18' 0&quot; (5.4m)</td>
</tr>
<tr>
<td>C3 8' 0&quot; (2.4m)</td>
<td>8' 0&quot; (2.4m)</td>
</tr>
<tr>
<td>D 4' (1.2m)</td>
<td>4' (1.2m)</td>
</tr>
<tr>
<td>E 9' 3&quot; (2.8m)</td>
<td>9' 3&quot; (2.8m)</td>
</tr>
<tr>
<td>F 10' 7&quot; (3.2m)</td>
<td>10' 7&quot; (3.2m)</td>
</tr>
<tr>
<td>G 50' 1&quot; (15.3m)</td>
<td>53' (15.9m)</td>
</tr>
<tr>
<td>H 41' (12.5m)</td>
<td>44' (13.4m)</td>
</tr>
<tr>
<td>L 23' 4&quot; (7.1m)</td>
<td>23' 4&quot; (7.1m)</td>
</tr>
<tr>
<td>N 10' (3.0m)</td>
<td>10' (3.0m)</td>
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<tr>
<td>P 11' (3.4m)</td>
<td>11' (3.4m)</td>
</tr>
<tr>
<td>Q 52' (15.9m)</td>
<td>52' (15.9m)</td>
</tr>
<tr>
<td>R 14' 3&quot; (4.3m)</td>
<td>14' 3&quot; (4.3m)</td>
</tr>
<tr>
<td>S 6' 3&quot; (1.9m)</td>
<td>6' 3&quot; (1.9m)</td>
</tr>
<tr>
<td>V1 5' 11&quot; (1.8m)</td>
<td>5' 11&quot; (1.8m)</td>
</tr>
<tr>
<td>V2 6' 8&quot; (2.0m)</td>
<td>6' 8&quot; (2.0m)</td>
</tr>
<tr>
<td>A A 30' 1&quot; (9.2m)</td>
<td>30' 1&quot; (9.2m)</td>
</tr>
<tr>
<td>AB 22' 6&quot; (6.9m)</td>
<td>22' 6&quot; (6.9m)</td>
</tr>
<tr>
<td>AC 21' 6&quot; (6.6m)</td>
<td>21' 6&quot; (6.6m)</td>
</tr>
<tr>
<td>AD 15' (4.6m)</td>
<td>14' (4.3m)</td>
</tr>
<tr>
<td>AE 32' (9.8m)</td>
<td>30' (9.2m)</td>
</tr>
<tr>
<td>AG 12' 4&quot; (3.7m)</td>
<td>12' 0&quot; (3.6m)</td>
</tr>
<tr>
<td>AH 8' 2&quot; (2.5m)</td>
<td>7' 10&quot; (2.4m)</td>
</tr>
<tr>
<td>AK 6' 4&quot; (1.9m)</td>
<td>6' 8&quot; (2.0m)</td>
</tr>
<tr>
<td>AL 22' 3&quot; (6.8m)</td>
<td>22' 3&quot; (6.8m)</td>
</tr>
<tr>
<td>AP 45° (13.7m)</td>
<td>46' (1.4m)</td>
</tr>
<tr>
<td>AQ 30° Up &amp; Down</td>
<td>30° Up &amp; Down</td>
</tr>
<tr>
<td>AR 90° Down</td>
<td>90° Down</td>
</tr>
<tr>
<td>AS 135° &amp; 165°</td>
<td>135° &amp; 165°</td>
</tr>
<tr>
<td>AU 25° 0&quot; (7.6m)</td>
<td>25° 0&quot; (7.6m)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6 x 4</th>
<th>6 x 6</th>
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<tbody>
<tr>
<td>AV 12' 8&quot; (3.8m)</td>
<td>12' 6&quot; (3.6m)</td>
</tr>
<tr>
<td>AW 12' 8&quot; (3.8m)</td>
<td>12' 6&quot; (3.6m)</td>
</tr>
<tr>
<td>AX 110°</td>
<td>110°</td>
</tr>
<tr>
<td>BA 30' 10&quot; (9.4m)</td>
<td>30' 10&quot; (9.4m)</td>
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<tr>
<td>BB 23' 10&quot; (7.3m)</td>
<td>24' 0&quot; (7.3m)</td>
</tr>
<tr>
<td>BC 21' 11&quot; (6.6m)</td>
<td>22' 1&quot; (6.7m)</td>
</tr>
<tr>
<td>BD 16' 5&quot; (6.0m)</td>
<td>16' 6&quot; (5.1m)</td>
</tr>
<tr>
<td>BE 11' 0&quot; (3.4m)</td>
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<tr>
<td>BF 10' 6&quot; (3.2m)</td>
<td>10' 9&quot; (3.3m)</td>
</tr>
<tr>
<td>BG 13' 6&quot; (4.1m)</td>
<td>13' 10&quot; (4.2m)</td>
</tr>
<tr>
<td>BH 26' 3&quot; (8.0m)</td>
<td>26' 3&quot; (8.0m)</td>
</tr>
<tr>
<td>BJ 19' 7&quot; (5.9m)</td>
<td>18' 8&quot; (6.0m)</td>
</tr>
</tbody>
</table>

Rated bucket tangential force with 36" (944mm) bucket: 16,900 lb (76.4kN)
Rated telescoping boom crown force: 21,050 lb (94.4kN)

TRAVEL DIMENSIONS
Boom in rack, without bucket:
Overall length: 6' x 10' 11" (3.3m)
Overall width: 6' x 6' 11" (3.5m)

WEIGHT
Approximate working weight, including 36" (944mm) bucket, fuel tank, and liquid contents:
6 x 4: 45,600 lbs (20,714.3kg)
6 x 6: 47,410 lbs (21,502.7kg)

Specifications subject to change without notice.