

**Product /Project Title:** Utica Hopedale Fractionator Facility – Phase I

**Product Owner:** MarkWest Ohio Fractionation, LLC.

**Product Location:** Hopedale, Ohio



**Three (3) 76'-0 Dia (40,000 BBL) 250 psig Propane Spheres**

**Three (3) 65'-0 Dia (25,000 BBL) 100 psig Butane Spheres**

**One (1) 78'-0 Dia X 49'-7 H (40,000 BBL) 5 psig Natural Gasoline Tank**

## Design Details

**All Spheres Designed to  
ASME Section VIII Division 2**

**Flat Bottom Tank Designed to  
API 620**

**Steel – A738GrB, A516-70,  
A36**

**Weight – 3,512 tons of steel**

**Thickest Plate for Propane  
Spheres – 1.781"**

### Sphere Geometry:

Diameter =>	76'-0
Capacity (Nominal) =>	40935 BBL
Capacity (Working) 2% Expansion =>	40087 BBL
Dimension H1 =>	44'-0
Dimension H2 =>	6'-0

### Sphere Shell Plate Thicknesses

Approximate Thickness Range * =>	1.688 in - 1.781 in
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### Design Code

Code =>	ASME Section VIII, Division 2
Edition =>	2010 Ed. 2011 Add.
Code Cases =>	

### Design Conditions:

Product Stored =>	Propane
Product Density =>	30.3 PCF
Design Pressure =>	250 PSIG
Design Vacuum =>	0 PSIG
Design Temperature =>	150 DEG F
Minimum Temperature =>	-20 DEG F
Joint Efficiency =>	100%
Shell Corrosion Allowance =>	0.0625 IN
Hydrostatic Test Ratio =>	1.43

### Wind:

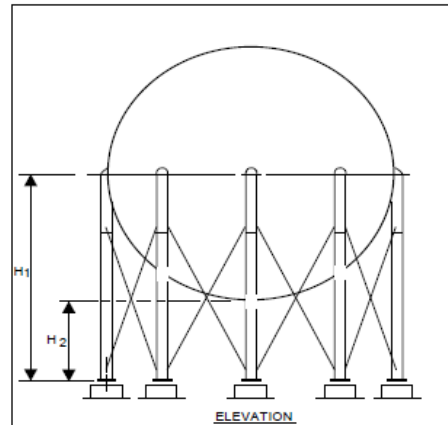
Code =>	ASCE-7 05
Velocity =>	90 MPH
Importance =>	1
Exposure =>	C
Shape Factor =>	0.5(Sphere) & 0.63 (Columns)

### Seismic:

Code =>	ASCE-7 05
Seismic Parameters =>	
Importance =>	1
Seismic Design Category =>	A
Site Class =>	C

### Material Specification:

Shell Plates =>	SA738 GR B
Bracing =>	A36
Columns =>	SA36
Column Stubs =>	SA738 GR B
Nozzles/Flanges =>	SA106B / SA350LF2



### Column Information:

No. of Columns =>	12
Column Size =>	42 in I.D.
Column Thickness =>	0.5 in (AS-BUILT)
Column Stub Thickness =>	0.375 in (AS-BUILT)
Column Bracing =>	5 in PLATE x 0.375 in THK.
Anchor Bolts per Column =>	( 2 ) x 1.25 in Dia
Column Circle =>	74.167 ft

### Others Requirements:

Stairway =>	CBI STD DOUBLE STRINGER w/CBI STD DONUT PLATFORM
	10' ID X 3' Wide Platform

Field PWHT Entire Sphere =>	YES
Fire Proofing of Columns =>	By CBI
Firewater System =>	YES
Insulation =>	NO
Nozzle Type =>	INTEGRAL
Flange Rating =>	300#



**All steel fabrication was self performed.**

**Field work included 2 and 3-plate ground assemblies being performed with an automated welding process.**



**All sphere welds were 100% Ultrasonic Tested (UT) in lieu of radiography as allowed by ASME Section VIII.**



**The 40,000 BBL Propane Spheres were Field PWHT'd holding at 1175 degrees Fahrenheit for 2 hours.**

**PWHT was self performed.**

**Following the PWHT, the Propane Spheres were Hydro- Statically Tested at 358 psig.**









**Turnkey Scope of Work also Included**

**Design and Construction of the Foundations**

**Galvanized Stairway and Top Platforms**

**Installation of Column Fireproofing**

**And Field Painting**

**Design and Installation of the Top Deluge and Lower Spray Fire Protection Spray System**

