

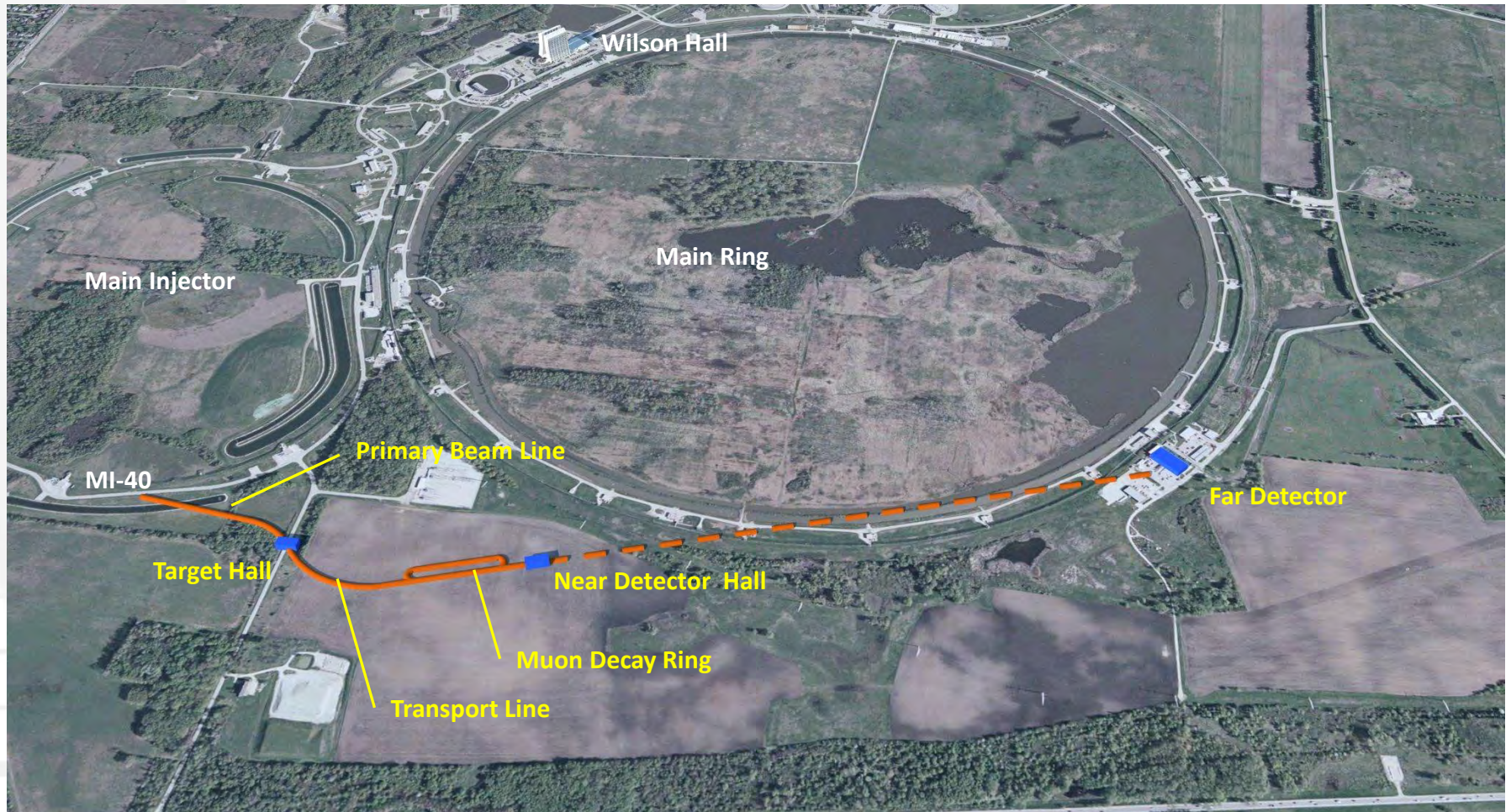
CONVENTIONAL CONSTRUCTION COSTING

S. Dixon, FESS/Engineering

nuSTORM Workshop - September 2012

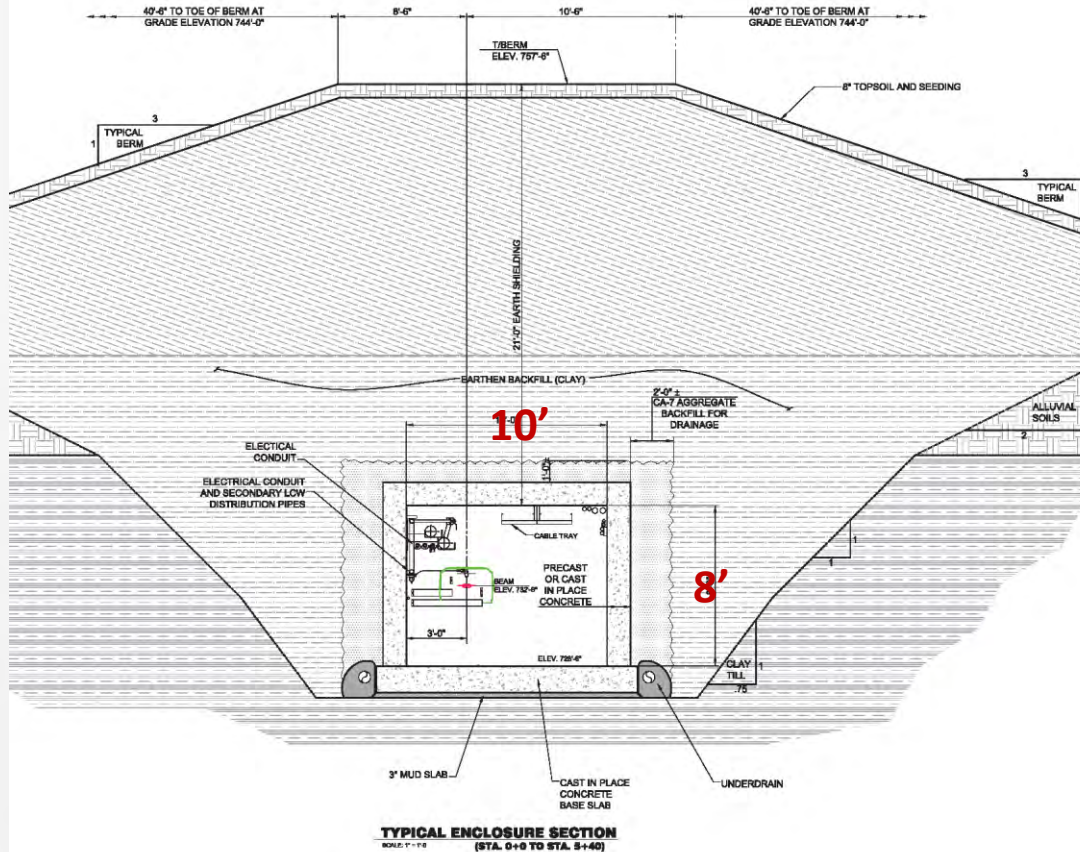
- FESS/Engineering Experience
- Costs Drivers for Similar Facilities
- Cost Considerations Not In Unit Costs
- Disclaimers and Next Steps

- Traditionally, the Facilities Engineering Services Section (FESS) has been responsible for the design and construction of conventional facilities on the Fermilab site;
- Within FESS, the Engineering Department provides a “cradle to grave” approach;
- FESS/Engineering includes in-house staff of 12 design professionals in five (5) disciplines (civil, architectural, structural, mechanical and electrical);
- Supplemental support from ~30 architectural/engineering firms currently under master ordering agreement;
- Provide Level 2 managers for projects (NOvA, Mu2e)



Beamline Enclosures

Primary Beam Line, Transport Line and Muon Decay Ring



Beamline Enclosure

(based on Main Injector style)

\$8,900 per Linear Foot

Includes:

- Concrete Enclosure
- 21 feet of shielding
- Exit Stairs
- Mechanical
- Electrical

Does Not Include:

- Primary Utilities
- Roads, Parking Lots
- EDIA, Management Reserve, Indirects

Below Grade Enclosures

(based on Mu2e Estimate)

\$696 per Square Foot

Includes:

- Concrete Below Grade Structure;
- 21 feet of shielding;
- 33 feet below grade;
- At-Grade Service Building with Crane;
- Mechanical;
- Electrical;

Does Not Include:

- Primary Utilities;
- Roads;
- EDIA, Management Reserve, Indirects

Cost Driver

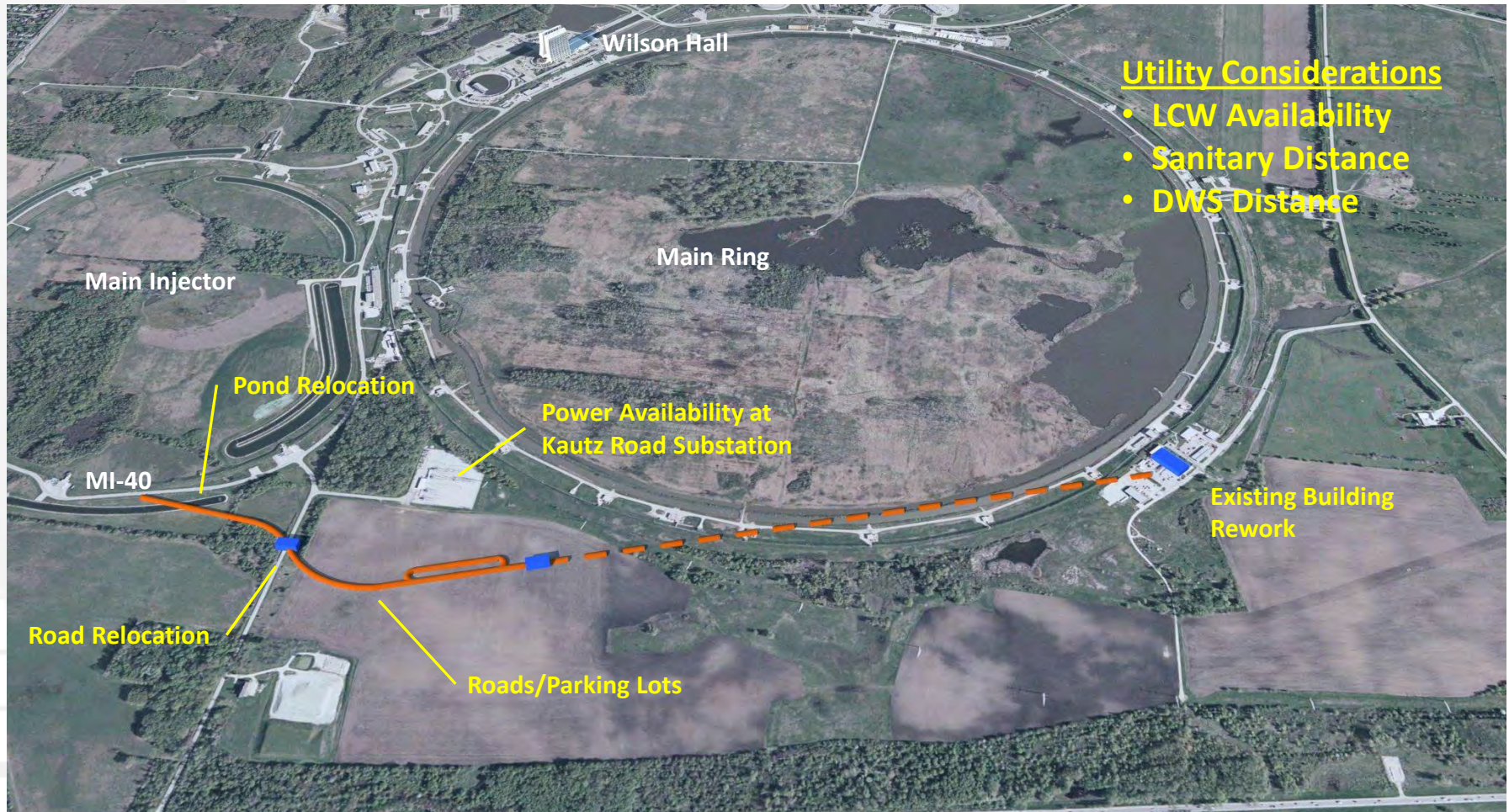
Plan

DETECTOR HALL - FLOOR PLAN

EXTINGUISH MONITOR ENCLOSURE - PLAN

Section

- **Primary Beamline** (assume 1,000 linear feet)
 - 1,000 lf @ \$8,900/lf = **\$8.9m**
- **Target Hall** (25' wide x 60' wide x 20' tall)
 - 1,500 square feet below grade
 - Assume ~2,500 square feet above grade
 - 4,000 sf @ \$696/sf = **\$2.8m**
- **Transport Beamline** (100 linear feet)
 - 100 lf @ \$8,900/lf = **\$0.9m**
- **Muon Decay Ring** (1,150 linear feet)
 - 1,150 lf @ \$8,900/lf = **\$10.3m**
- **Near Detector Hall** (40' wide x 60' wide x 20' tall)
 - 2,400 square feet below grade
 - Assume ~4,600 square feet above grade
 - 7,000 sf @ \$696/sf = **\$4.9m**



- Power Requirements;
- Cooling Requirements;
- Special Shielding Requirements;
- Access Requirements;

- Disclaimers:
 - Preliminary Concept at this stage;
 - Costs are based on unit figures from recent projects. Might not be applicable to nuSTORM;
 - Costs are for Conventional Construction only;
 - Standard Lab multipliers (EDIA, Management Reserve, Escalation and Indirects) are not included.
- Next Step – Project Definition Report
 - Fleshing out of the technical criteria;
 - Development of a possible solution;
 - Drawing Development;
 - Refined Cost Estimate.