CONSTRUCTION PLANNING AND PROGRESS MEETING
BROUGHT TO YOU BY INFRASTRUCTURE PLANNING AND FACILITIES
Thursday, September 10, 2015

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They are available at each table

• Please fill out your surveys and return them to the front table before you leave.
• We want your thoughts and suggestions about how you feel Construction Junction went, and what we could do to improve.
• Thank you in advance!
Today’s agenda

• MSU Board of Trustees updates

• Informational
  o MSU Bikes

• New projects
  o T.B. Simon Power Plant – capacity and future needs

• Project updates
  o MSU College of Law – north entrance site improvements
  o North campus infrastructure improvement - West Circle Drive 2015
  o Duffy Daugherty Football Building - renovate locker room and training room
  o Facility for Rare Isotope Beams – building structure
  o Cyclotron – addition 16 – office
Step 2: Authorization to proceed

- Electrical distribution – upgrade northwest zone
- T.B. Simon Power Plant – capacity and future needs
- Crop Science - storage building 2 – construct original building
Step 2: Authorization to proceed

- Breslin Student Events Center - facility upgrades
- Food Processing and Innovation Center
- Hubbard Hall - exterior masonry repair
MSU Bikes

“On the banks of the Red Cedar...”
Tim Potter

• Sustainable Transportation Manager – MSU Bikes Service Center
• Co-founder of Campus Bike Programmer’s Network
www.universitybikeprograms.org
MSU Bikes’ story

• Founded as volunteer-run program in 2003 by Gus Gosselin and Terry Link (Office of Campus Sustainability) with the purpose of repairing abandoned/donated bikes for loan to university faculty/staff to encourage bicycling.

• Established as a university-funded operation summer 2006. Opened fall 2006 in the former canoe rental facility under Transportation Services.

• Reorganized under Surplus/Recycling summer 2012.
MSU Bikes services

• Services offered: bike rentals, sales, repairs and accessories.

• Additional services: bike-related classes (maintenance, how-to clinics, etc.) during down-times and consulting on campus facility projects.
MSU Bikes rental transactions

- 2003: 25
- 2004: 115
- 2005: 175
- 2006: 200
- 2007: 220
- 2008: 223
- 2009: 446
- 2010: 642
- 2011: 626
- 2012: 650
- 2013: 675
Enhanced security bike parking facilities

- University ID card access and logging
- Covered, lit and fenced
- Better bike racks for maximum capacity
- Adds multi-modal options to car parking ramps
- Reduces car parking congestion on campus
- DIY bike repair stations in each
Bikes aren’t just for students

They can be used by staff around campus to:

• Reduce parking demand/congestion
• Improve general physical and mental health
• Reduce need for motor vehicles (delivering smaller packages, traveling across campus for meetings, etc.)
• Quicker and easier for maintenance staff for many campus trips
• Reduce green-house gases
• Stretch tight budgets for alternative campus transportation (cost of leased parking spaces and leased vehicles)
Bikes at work
Challenges
MSU Bikes

Improvements
Bicycling on an unmarked sidewalk vs. the newly redesigned river path on the MSU campus
Fun with bikes
Questions?

Tim Potter, Manager
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Energy Planning

Dr. Wolfgang Bauer
Senior Consultant
Office of the Executive Vice President for Administrative Services
Our challenge: MSU’s energy imperatives

- **Facility for Rare Isotope Beams (FRIB)**
  Requires a reliable 18-20 MW power source on a limited timeline

- **Reliability and cost**
  Low-cost, highly reliable energy strategy that is based on full costing of the infrastructure and long term cost of the operating budget. Preserve debt capacity

- **Energy Transition Plan (ETP)**
  Goals for renewable energy, health and the physical environment within constraints of maintaining reliability and capacity for growth

- **Tightening regulations**
  Current EPA coal regulations require an investment in Sorbent Injection by 2017 to provide short-term flexibility. Additional regulations expected
New electrical substation and switch-house on track to meet FRIB and campus needs

**T.B. Simon upgrade utility substation**
- Larger substation with two 50 MVA transformers with space for a future third transformer
- Underground 138kV transmission line
- Connection to the new switch-house

**FRIB/campus power Connection (switch-house)**
- Switch-house provides an interface point for connecting FRIB, the T.B. Simon Power Plant, new substation and the campus

- **Reliable** power for FRIB by first quarter 2017
- Potential for increased efficiency and **cost savings** by shifting a portion of campus power load to the substation to improve the steam/electric balance of the T.B. Simon Plant
- Ability to integrate future renewable energy and growth in support of the Energy Transition Plan

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Update
Revised duct bank route allows for a redundant transmission line and is expected to reduce costs ~$2M

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**Timeline:**
- **Dec 2014** BOT Action to Proceed Substation and switch-house
- **Feb 2015** Substation contract signed
- **Jan 2016** Switch-house substantially complete, connect FRIB to Simon Plant
- **Aug 2016** Substation construction 50% complete
- **Nov 2016** Substation transformer 1 active
- **March 2017** Substation transformer 2 active and 46kv substation removal. Connect FRIB to substation
- **Spring 2017** FRIB active 7-8 MW
Commitment to cease burning coal by the end of 2016

In April 2015 President Simon announced that MSU will stop burning coal by the end of 2016, with the majority of coal purchasing and burning ending in 2015.

MSU will switch to natural gas as the primary fuel source.

Planned sorbent injection to meet coal Boiler MACT regulations now not required, resulting in ~$4.5M avoided capital costs.

Clean fuel extends life of existing plant equipment.

Fuel Distribution at T.B. Simon Power Plant, 2013-14
Steps are being taken to ensure the reliability and cost effectiveness of natural gas as the primary fuel source.

**Cost:** MSU is working with U.S. Energy Services to utilize layered gas purchase contracts. Several million dollars have been saved with **$1M re-allocated to MSU’s academic mission**.
Moving into solar with a proposed 10 MW carport solar solution

10 MW carport solar project

- Long term power purchase agreement (PPA) for renewable energy that would be generated from the construction of large scale solar arrays over five parking lots.
- The university will purchase all power produced by these solar arrays at a fixed rate over the life of the agreement.
- The university will have the option to purchase the arrays after seven years of operation.

- **Financial benefits** to MSU by allowing MSU to purchase power at a fixed price over the next 25 years.

- **Advances the Energy Transition Plan** by improving the environment, investing in sustainable energy research and development, and positioning MSU as a leader in the realm of sustainable energy.
T.B. Simon Power Plant – capacity and future needs

Potential solar carport locations

LOT 83
4.49 MW AC

LOT 89
4.75 MW AC

LOT 91
2.05 MW AC

LOT 92
0.84 MW AC
Design example
Preliminary design examples

Lot 83
Preliminary design examples
Preliminary design examples
**Proposed carport solar solution has financial benefits**

- PPA allows MSU to purchase power at a fixed price of **$98/MWh** over the next 25 years.
- 2015 public service commission utility rate **$91/MWh**, but will increase. (DOE-EIA projection: 2.3%/year; last decade: 3.35%/year)

Projected avoided costs **~$10M** for MSU over the 25 year PPA period.
Integrating to create a reliable and cost efficient energy portfolio near-term

At night purchase lower cost off-peak electricity through substation tie line to run T. B. Simon Plant “in balance” and reduce costs.

As the sun sets the tie line is utilized again at off-peak rates to keep the T.B. Simon Plant in balance and ensure recoup of substation capex.

Solar powers up as the sun and campus demand rises. Tie line purchases are phased out to minimize on-peak energy and demand charges.

Electricity supply options:
- Yellow: Solar
- Dark green: Substation tie line
- Grey: T.B. Simon Plant
MSU’s Energy Imperatives

Reliability ✔ ✔ ✔
Efficiency ✔ ✔ ✔
Cost Savings ✔ ✔ ✔
Regulations ✔ ✔
FRIB Power ✔ ✔
Environment ✔ ✔ ✔

Solar Arrays
FRIB duct bank
136 kV duct bank
Gas pipeline
MSU continues on a path to meet energy imperatives and build to high performance

- Phase-Out coal and ensure reliable natural gas supply
- Substation to provide FRIB and campus electric power
- Integrate 10MW solar project to create a reliable and cost efficient energy portfolio
- Optimize the next set of investments in the T.B. Simon Plant

High performance
- Lower cost
- Highly efficient
- Breakthrough technologies
- Energy leader
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Why?

• Enhance existing main north entrance
• Recognize the MSU College of Law history - and its origins as the Detroit College of Law. The College intends to name the new entry the DCL Plaza.

Scope

• New entry canopy
• New outdoor seating area, which replaces some bike parking
• Relocation of two limestone friezes from Detroit, along with historical and donor recognition plaques
• Improvements to lighting, wi-fi, pavement and landscaping are planned.
Impacts:

• Construction deliveries and minimal walk construction will require intermittent single lane short-duration closures along west-bound Shaw Lane.

• Pedestrians will be impacted intermittently by shifting crosswalk locations for short durations. The main entrance to the building will not be closed.

Timeline:

• Construction start: August 2015
• Project completion: September 30, 2015
Aerial view of site

PROJECT ZONE

ENTRANCE

LAW BUILDING
Existing north entrance
East façade – to be emulated on new north canopy
Demolition, underground sewers and foundation complete – preparing for steel and masonry
Two salvaged stone friezes from the original Detroit College of Law – to be placed in new entrance brick columns
Rendering of proposed improvements
MSU College of Law – north entrance site improvements
September 2015

Rendering of proposed improvements – view from west
Construction representative:
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MSU College of Law – north entrance site improvements
September 2015

MSU College of Law - North Entrance Site Improvements

Project phase: Planning/Design

The MSU College of Law desires a more prominent and welcoming entrance that would also serve to recognize its history and Detroit origin.

Project Goals:
- Goal to enhance existing main north entrance
- Recognize the MSU College of Law history, and its origins as the Detroit College of Law. The college intends to name the new entry the DCL Plaza

Project Scope:
- Installation of a new entry canopy
- New outdoor seating area, which replaces some bike parking
- Relocation of two limestone friezes from Detroit, along with historical and donor recognition plaques.
- Improvements to lighting, wireless network, pavement and landscaping are planned
Project location
Why?

• Replaced existing structurally deteriorating arch steam tunnels from the North Campus Substation to Steam Vault 376 (northeast corner of Library building), some of which were 87 to 102 years old.

• Providing new steam services to Olds Hall and completing the north campus steam loop (which also includes steam distribution work in the NCS).

• Installed new electrical duct bank from the NCS to north of Olds Hall and replaced deteriorated electrical vault lid by Olds Hall.
Why?

• Road reconstruction of West Circle Drive (two 10-foot traffic lanes, one four-foot bicycle lane) from the east side of the MSU Library to the west side of the Auditorium Road and West Circle Drive intersection completed. Improved pedestrian, vehicular and bicycle safety.

• Reconfigured Parking Lots 6 and 11 to meet current parking standards.

• Replaced deteriorated cast iron water mains and improved fire flow capacity.

• Decommissioned NCS electrical transformers.

• Repaired/replaced deteriorated sanitary and storm sewer mains.
Timeline

• Construction early preparation: March – May
• Construction began: May 11
• West Circle Drive and Parking Lot 6 reopened: July 12
• Parking Lot 11 and access drives reopened: August 14
West Circle Drive – overall plan and phases

Phase 4 of 4
Bike racks at the front entrance to Olds Hall
Sidewalk to Library main entrance
MSU Museum
West Circle Drive
Construction representative:
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Why?

- Training facilities were last updated in the mid-1990s.
- Major technological changes have occurred in training therapy delivery methods since then.
- The installation of modern equipment necessitated reconfiguration of the existing space.
- The locker rooms in the building were in need of functional, spatial and aesthetic refurbishment, as they no longer reflected Big-Ten-level facilities.
Scope

• **Training room**
  - Installed new therapy pools, reconfigured office area, reception/monitoring and treatment spaces.

• **Locker room**
  - Reconfigured locker arrangement for a more open layout and installed new lockers.
  - Redistributed ventilation system.
  - Updated furniture, finishes and technology.
Impacts

• Occasional road closures occurred on Shaw Lane during portions of the project due to truck traffic.
• The building remained open during the project, and alternate routes through the building were provided for occupants.

Timeline

• Construction started: January 2015
• Ready for occupancy:
  • Locker room – June 1
  • Training room – July 17
Duffy Daugherty Football Building – renovate locker room and training room
September 2015

Training room reception desk
Training room – looking southwest
Locker room

Duffy Daugherty Football Building – renovate locker room and training room
September 2015
Duffy Daugherty Football Building – renovate locker room and training room
September 2015

Locker room
Construction representative:
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Duffy Daugherty Football Building – renovate locker room and training room
September 2015

Duffy Daugherty Football Building - Renovate Locker Room and Training Room

Project phase: Construction

Duffy Daugherty’s training facilities were last updated in the mid 90’s. Since then, major technological changes have occurred in the training therapy delivery methods. The installation of modern equipment will necessitate reconfiguration of the existing space. Similarly, the locker rooms in the Duffy building are in need of functional, spatial and aesthetic refurbishment, as they no longer reflect Big Ten level facilities.

Project details:

- Training Room: Install new therapy pools, reconfigure offices area, reception/monitoring and treatment spaces
- Locker Room: Reconfigure Locker arrangement for a more open layout and install new lockers, redistribute ventilation system, update furniture, finishes and technology

The Duffy Daugherty Football Building is located at the corner of Chestnut Road and Shaw Lane.

Detour Information:
The southernmost lane of eastbound Shaw Lane and the adjacent sidewalk will be closed from January 12 to March 1. Pedestrians and bicyclists will be re-routed to the north side of Shaw Lane. Motorists will be able to use the inside lane on the eastbound side of Shaw Lane during this closure. This detailed map outlines detour impacts and project phasing.
FRIB traffic and pedestrian routing during construction

Present to October 2016

• Restripe and turn over one west-bound and two east-bound lanes
  o Site fence moved south
  o Bike path open

November 2016

• All four lanes of Wilson Road will be re-opened
Building layout
Rendered perspective – southwest view
Rendered perspective – southeast view
Rendered perspective – northeast view
FRIB construction – aerial view
FRIB construction progress
Working ahead of baseline schedule

- Metal panels are being installed on the north elevation
- Interior painting has begun on the upper 2nd floor
- Masonry is ongoing at the perimeter, upper end, and lower second floor
- Tunnel lid concrete being placed this week and next week
- Half of first floor front end area concrete has been placed
- Roofing installation continues
- Nonconventional utilities piping is continuing in the pit area
FRIB construction progress

Tunnel lid re-steel looking east

Target area view
FRIB construction progress

Roof installation on the east end

View of linac tunnel – facing east
Project information

Project representative:
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(517) 908-7751

Additional information:
www.frib.msu.edu
Why?

• To expand the office portion of the facility to accommodate the new staff, faculty, and students that are being hired in support of the FRIB project

Scope

• The project consists of the following elements:
  o Partial demolition of the existing Cyclotron
  o Build out of electrical and mechanical systems
  o New six-story office addition, approx. 74,000 square feet
  o First floor features, 265 seat auditorium
  o Floors two thru six will consist of perimeter office, with open space in center areas
Aerial view of site showing location of office addition (photo taken July 2015)
Construction update:

- Underground utility work is complete
- Structural steel to be complete by mid-September
- First slab pour will occur at the end of September
- Building will be enclosed by January 2016

Schedule

- Construction started: February 2015
- Ready for occupancy: August 2016
Erection of structural steel
• Typical office floor plan, floors 2 through 6
• Private offices around the north/south perimeter
• Cubicles/bench seating in middle
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Construction Junctions continue monthly

Meetings are at 8:30 a.m. the second Thursday of the month

- October 8 (College of Law, room 343)
- November 12 (College of Law, room 343)
- December 10 (TBD)

Please sign in and take a survey before you go!