

Outline for C0 IR Design Report – version 1

M Church 11/19/03

Editor: M Church

- 1) Introduction – motivation, background, overview [M Church](#)
- 2) Accelerator physics [J Johnstone](#)
 - a. design issues, requirements, constraints, operating modes, operational requirements, history [J Johnstone](#)
 - b. overview of design: layout and lattice functions, beam envelopes, slot lengths, magnetic field specification [J Johnstone](#)
 - c. helix solutions for all modes [J Johnstone](#)
 - d. dynamic aperture, comparison with Run II lattice, field quality specifications [tbd](#)
 - e. beam loss/halo calculations and collimation scheme [tbd](#)
 - f. dipole correction circuit requirements [J Johnstone](#)
 - g. skew quad, sextupole, octupole, and feeddown circuit requirements [J Johnstone](#)
 - h. bpm requirements [J Johnstone](#)
 - i. alignment requirements [J Johnstone](#)
 - j. emittance growth calculations, comparison with Run II lattice [tbd](#)
- 3) LHC style quads [J Kerby + designees](#)
 - a. Cable and steel specifications
 - b. Dimensional specifications
 - c. Field quality specifications
 - d. Electrical specifications
 - e. Cryogenic specifications
 - f. Support and alignment specifications
 - g. Quench protection requirements
 - h. Measurements and R&D to date
 - i.
- 4) New spools [J Kerby + designees](#)
 - a. Cable and coil specifications
 - b. Dimensional specifications
 - c. Field quality specifications
 - d. Electrical specifications
 - e. Cryogenic specifications
 - f. Power feedthrough specifications, R&D plans
 - g. Support and alignment specifications
 - h. Quench protection requirements
 - i.
- 5) Power Supplies [D Wolff + designees](#)
 - a. Number and layout (including 50A supplies)
 - b. Buswork specification and layout
 - c. Electrical specifications
 - d. AC power and LCW requirements
 - e. Controls specifications
 - f. B4 and C1 qpm specifications
- 6) Cryogenic Systems [A Klebaner](#)
 - a. Helium usage limitations

- b. Cryogenic schematics
 - c. Cryogenic controls and software modifications
 - d. Specification of new cryogenic components
 - e. Interface specification
- 7) Vacuum Systems [R Reilly](#)
- 8) Controls, beam instrumentation, and software [S Lackey](#)
- a. Integration with current Tevatron systems (MDAT, abort loop, ...)
 - b. Low beta qpm system
 - c. Application software requirements
- 9) Commissioning [M Church and tbd](#)
- 10) Conversion of C0 region to “normal” straight section [P Garbincius](#)
- a. Requirements, motivation, lattice changes
 - b. Installation work
 - i. Removing MI dipoles, C-mags [R Reilly](#)
 - ii. Modifying B4 and C1 layout [R Reilly](#)
 - iii. LCW requirements for C0 Collision and Assembly Halls [J Riordan](#)
 - iv. Controls, qpm, and software modifications [S Lackey, K Martin](#)
 - v. Power supply modifications [D Wolff](#) or designee
 - vi. Synch light modification [S Pordes](#)
- 11) Integration, installation schedule, and cost [P Garbincius, M Church, R Reilly](#)
- a. Tunnel layouts [J Brandt](#)
 - b. Q1/TSP removal from A4,B1
 - c. Schedule
 - d. Cost