

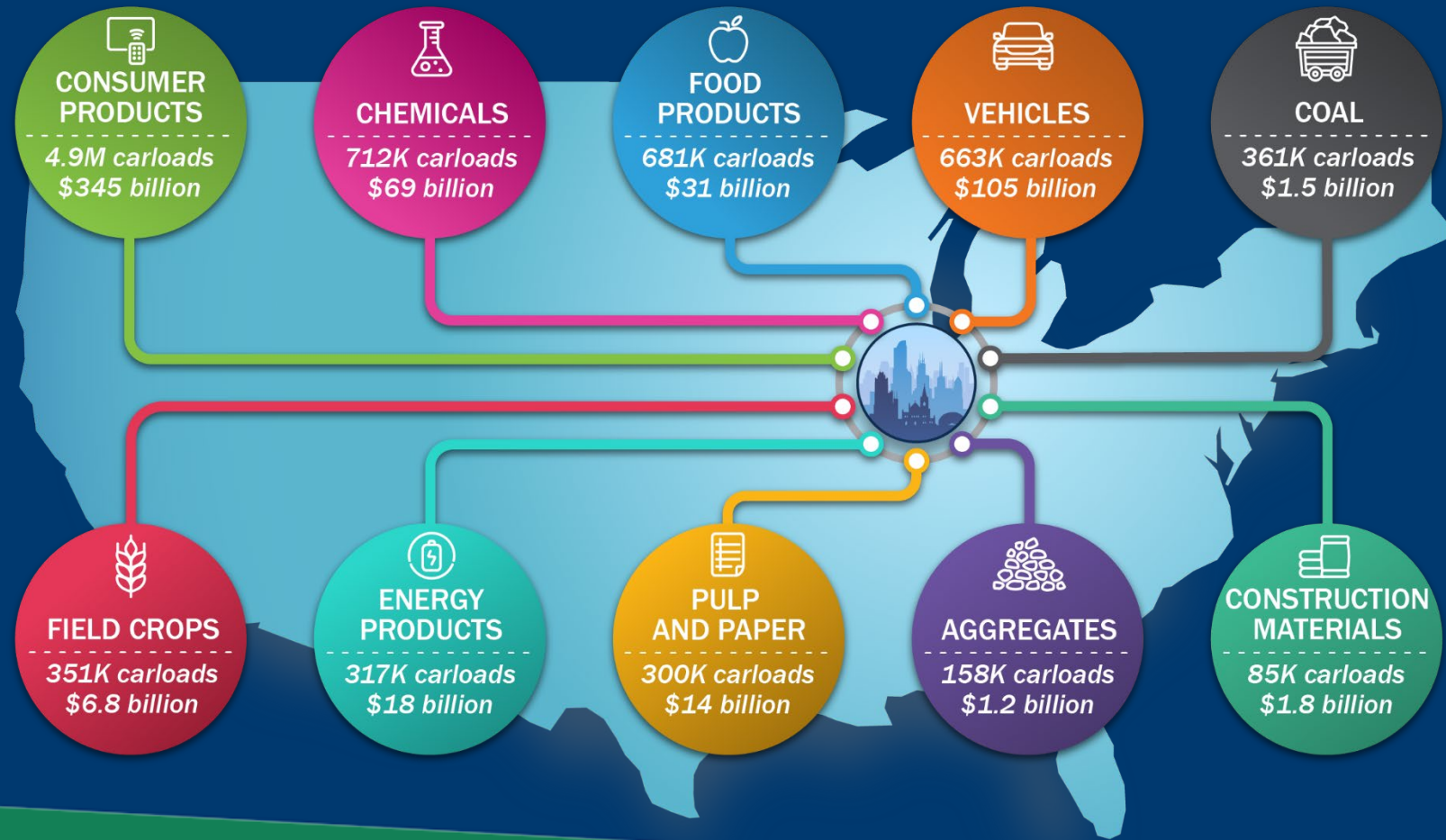


The CREATE Region Environmental & Transportation Efficiency Program

Northwestern University
November 16, 2023

Chicago: The American Rail Network Hub

Chicago's rail system handles 47% of intermodal rail containers and 29% of rail cars in the U.S.; \$652B worth of goods each year.



North American Rail Trade Depends on Chicago

- **47% of all intermodal units in the U.S. move through Chicago**
- **Between 2005-2019, Chicago outperformed the national rail market, particularly due to increasing intermodal traffic**
- **CA, TX, B.C. and WA top origins of rail traffic moving to and through Chicago***
- **CA, Ontario, TX and PA top destinations of rail traffic moving from and through Chicago***

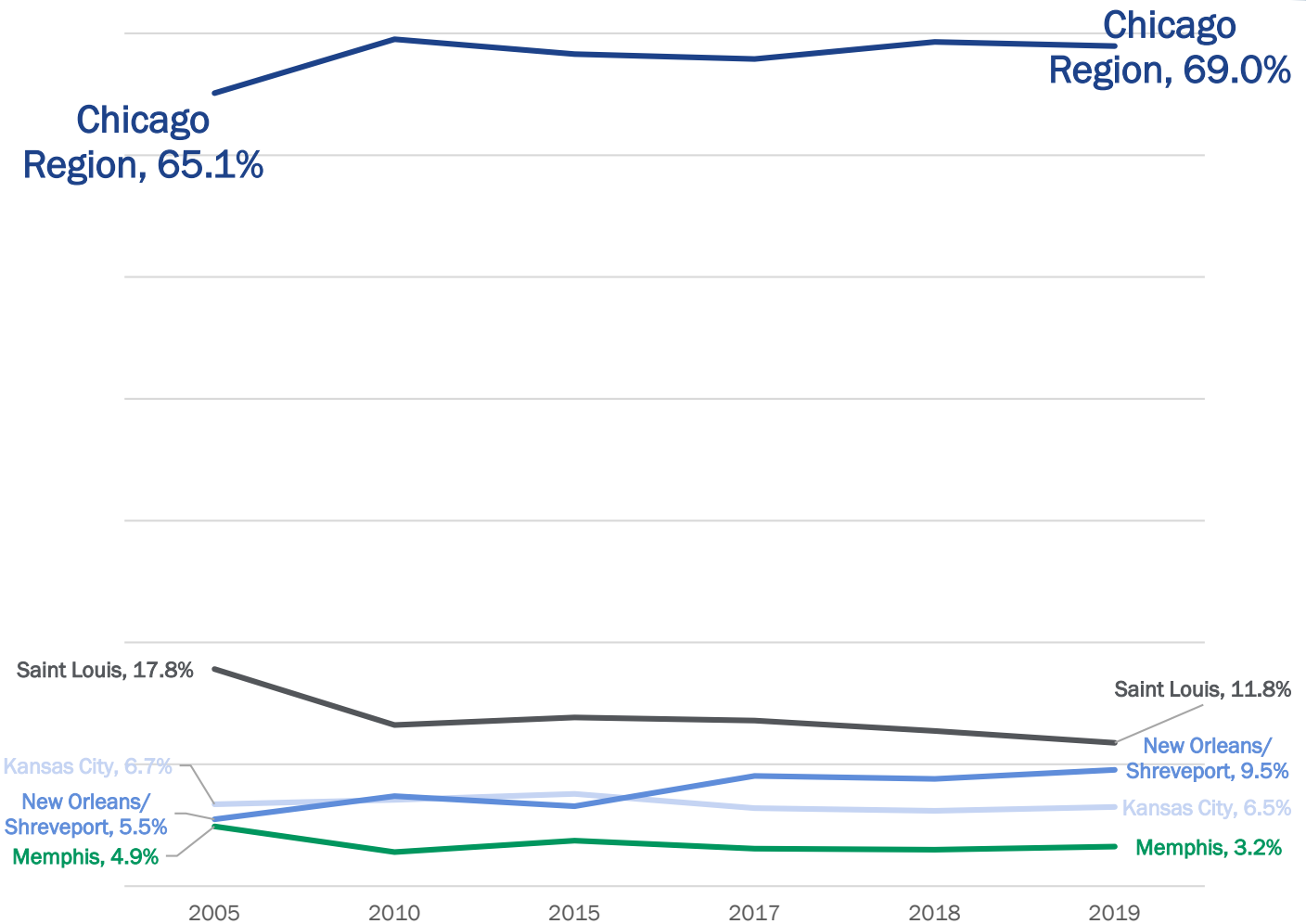
**Measured by value*

Source: Confidential Surface Transportation Board Waybill Data, 2005-2019



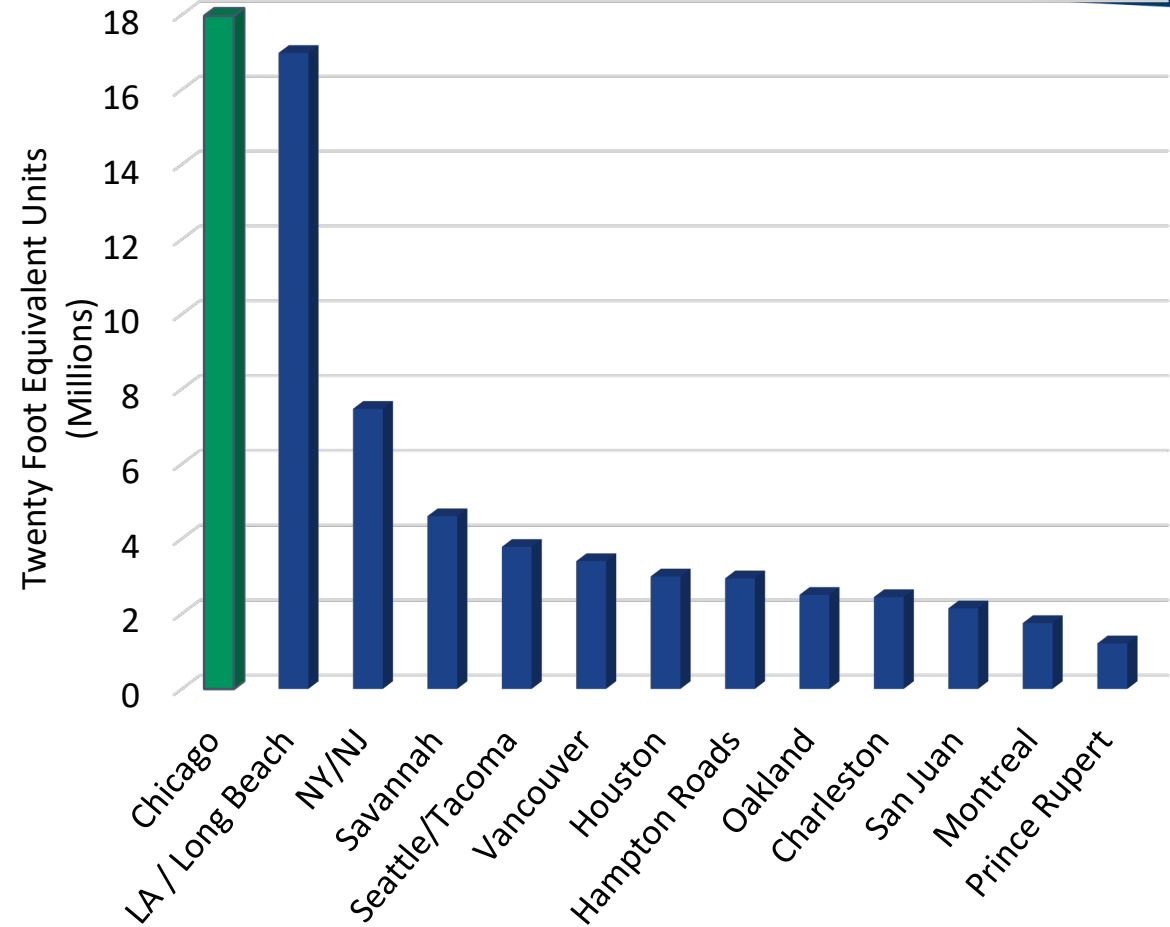
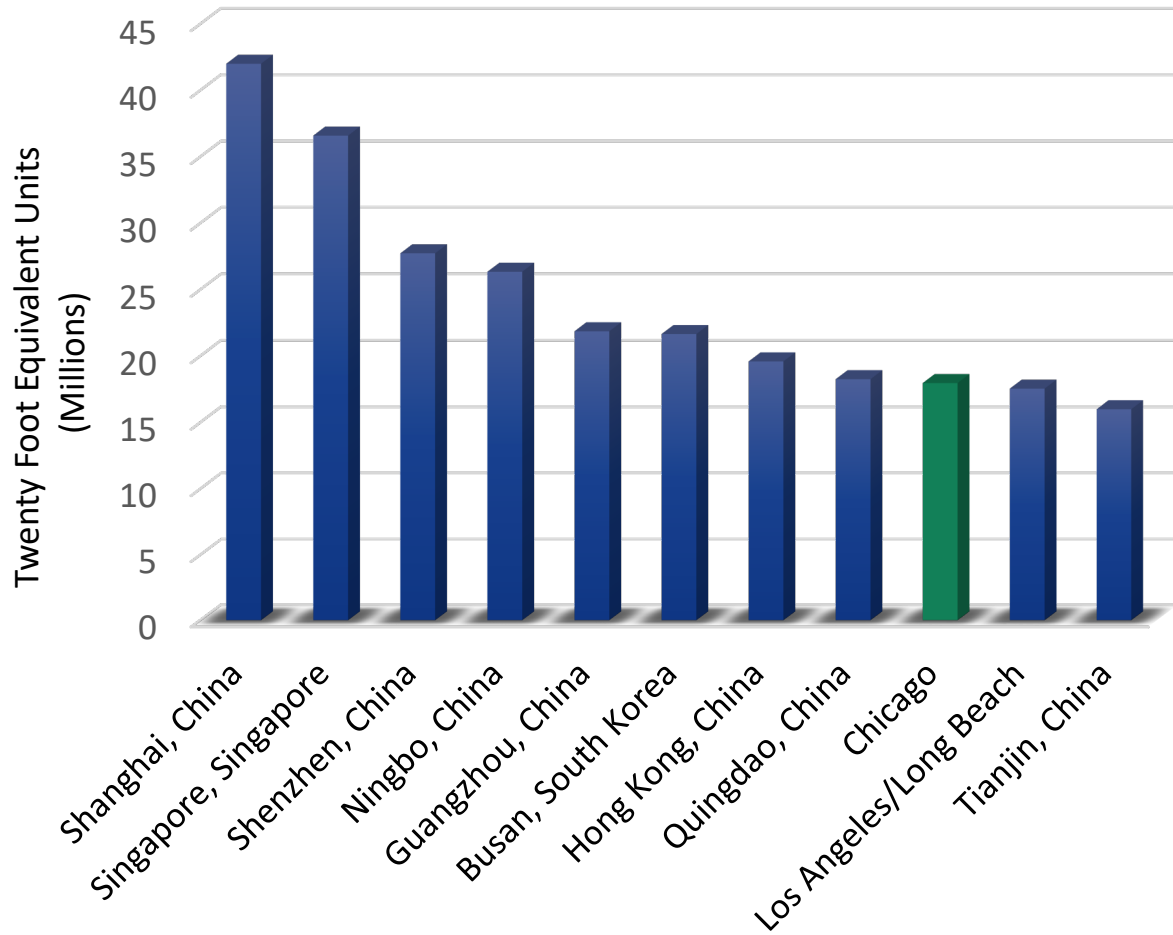
Chicago Remains Largest North American Rail Gateway

- **Chicago region dominates the U.S. rail market in market share and total volumes moved**
 - Chicago handles about 69% of all East-West Gateway Traffic and 86% of intermodal East-West Gateway Traffic
 - Chicago's market share among East-West Gateways is increasing



Source: Confidential Surface Transportation Board Waybill Data, 2005-2019

Top Global and North American Container Ports, 2019



Why CREATE?

The Chicago region remains the nation's premier freight and rail hub

Freight rail trade (by value) within Chicago will more than double between 2012 and 2045



We must modernize the rail network to maintain and improve our region's economic competitiveness

Many of the region's rail lines are inadequate for current and future freight and passenger needs

What is CREATE?

A \$5 billion Public-Private Partnership (PPP) to improve transportation through the Chicago region.



Increases capacity, speed and reliability for freight train traffic



Separates freight and commuter trains at 6 key junctions



Eliminates 25 road/rail grade crossings through grade separations

CREATE is a cooperative program among:

US Dept. of Transportation (FHWA & FRA), Illinois Dept. of Transportation (IDOT), Cook County Dept. of Transportation and Highways (DOH), Chicago Dept. of Transportation (CDOT), 6 major North American freight rail carriers and 2 switching railroads, 2 passenger carriers (Amtrak and Metra).

CREATE Partners



BUILDING AMERICA®



Four Corridors



Passenger Corridors



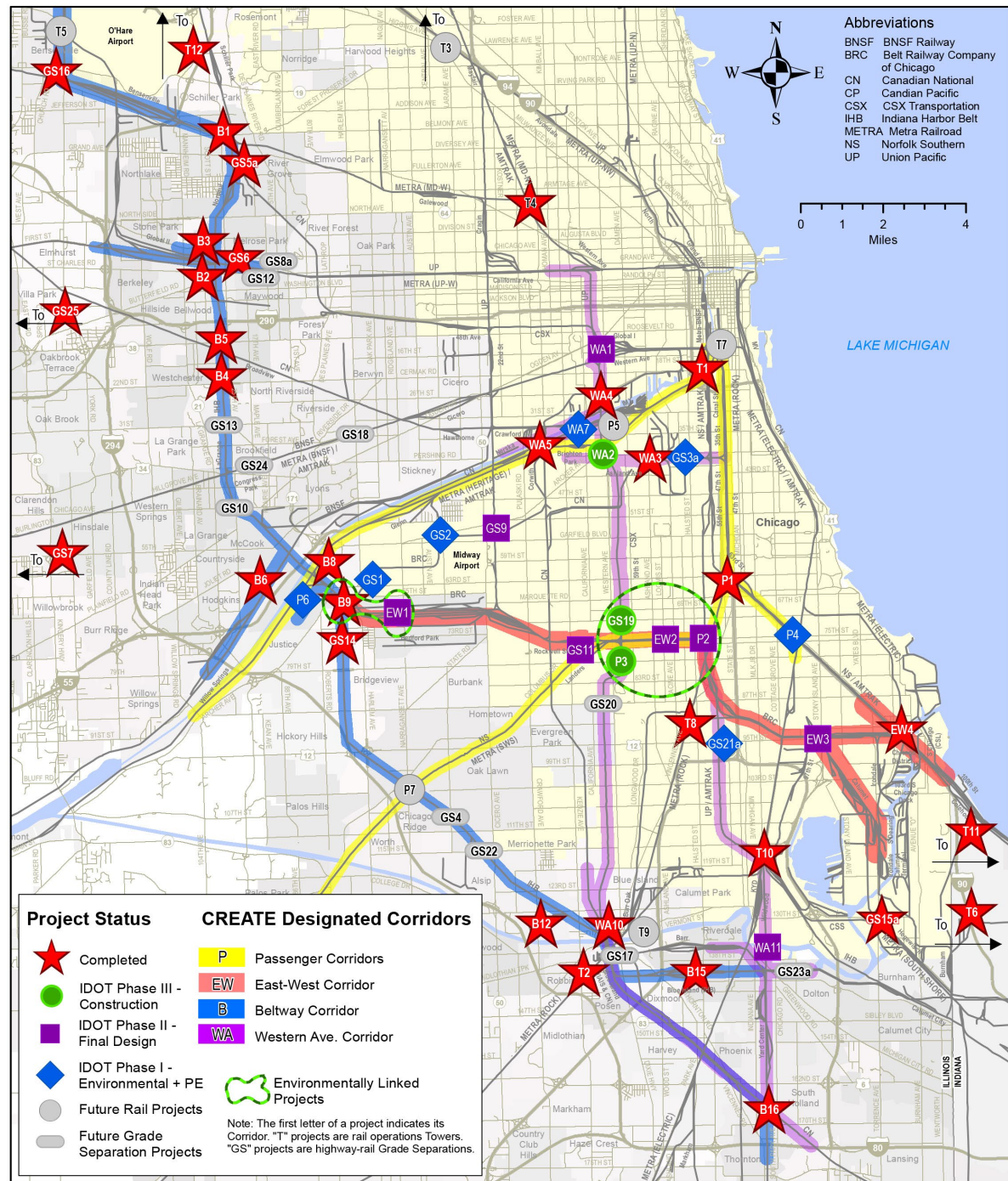
East-West Corridor



Beltway Corridor



Western Ave. Corridor



Project Status

Completed projects

33

Projects under construction (Phase III)

4

Projects in final design (Phase II)

8

Projects in environmental review (Phase I)

7

Remaining projects

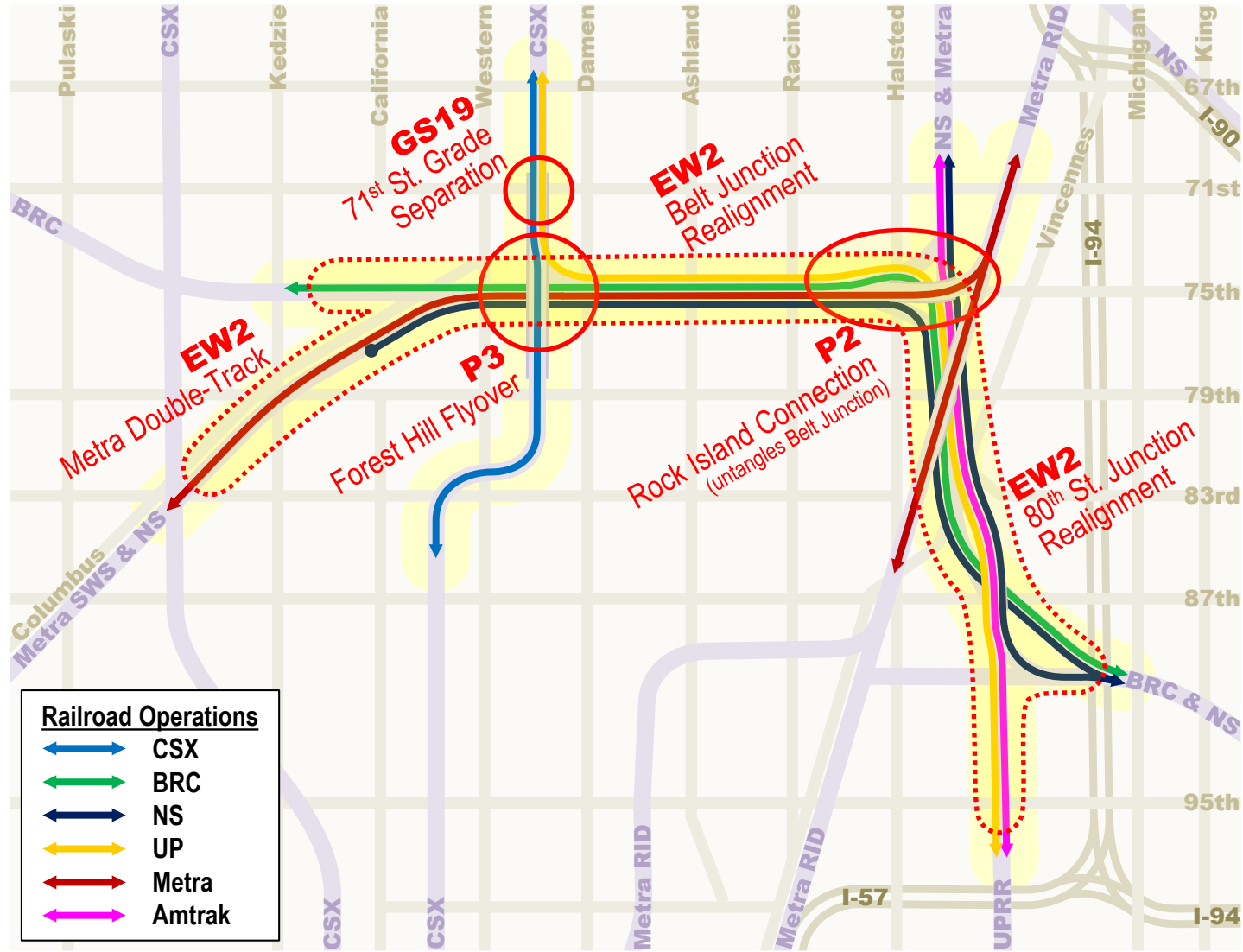
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75th St. Corridor Improvement Project

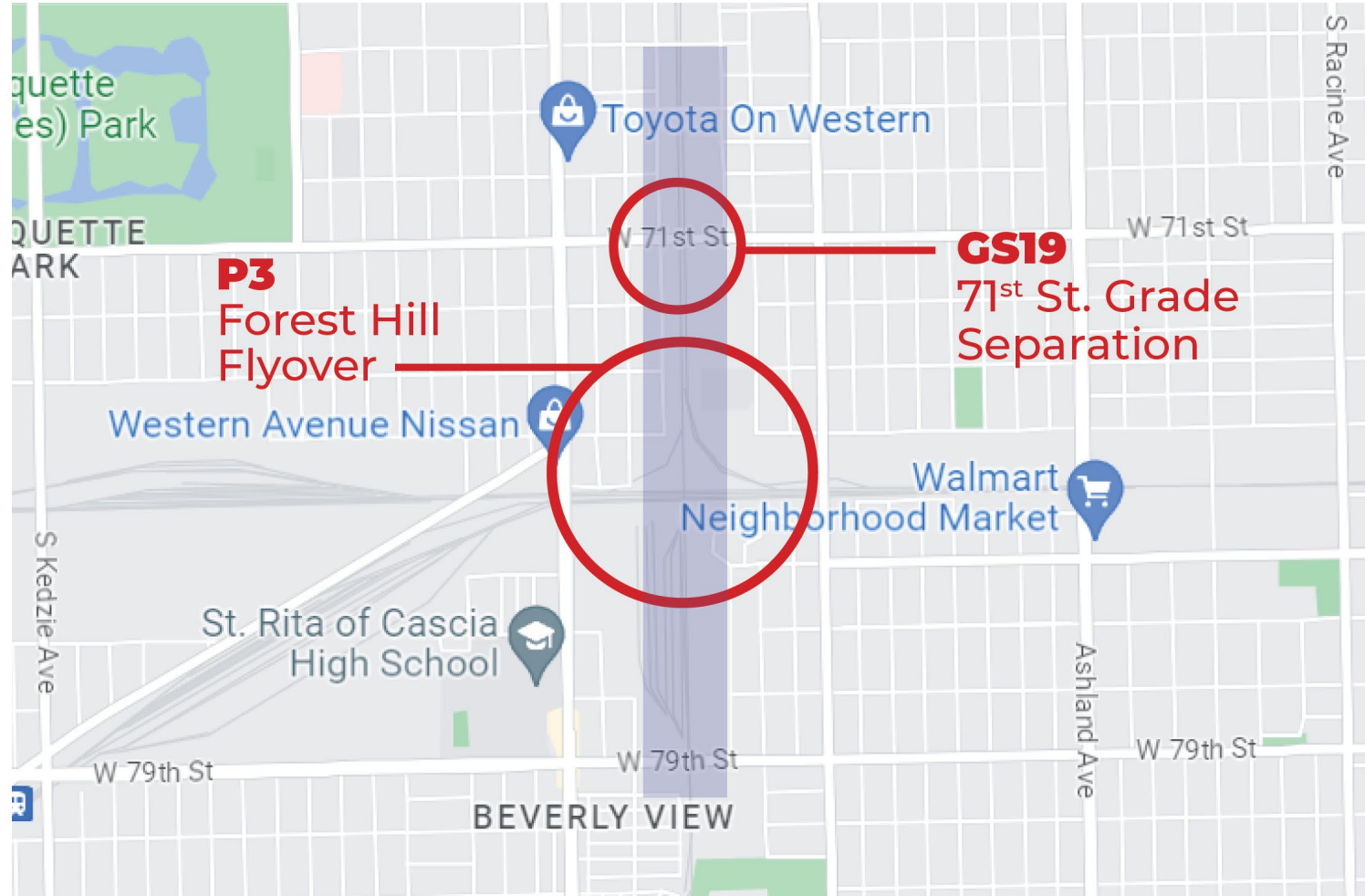
The CREATE partners will seek future funding to undertake construction of P2 and EW2.



		Design	Construction
P3			
GS19			
P2			
EW2			



Forest Hill Flyover (P3) and 71st Street Grade Separation (GS19)





P3 Design Considerations

Forest Hill Flyover (P3) and 71st Street Grade Separation (GS19)

- **First two components of 75th Street CIP:**
 - P3, a North-South rail flyover structure, will eliminate train conflicts
 - GS19, a road/rail grade separation, will end delays to community members at blocked crossings
- **Phase I PE – full viaduct**
- **Phase II FE – combination viaducts and retained fill**

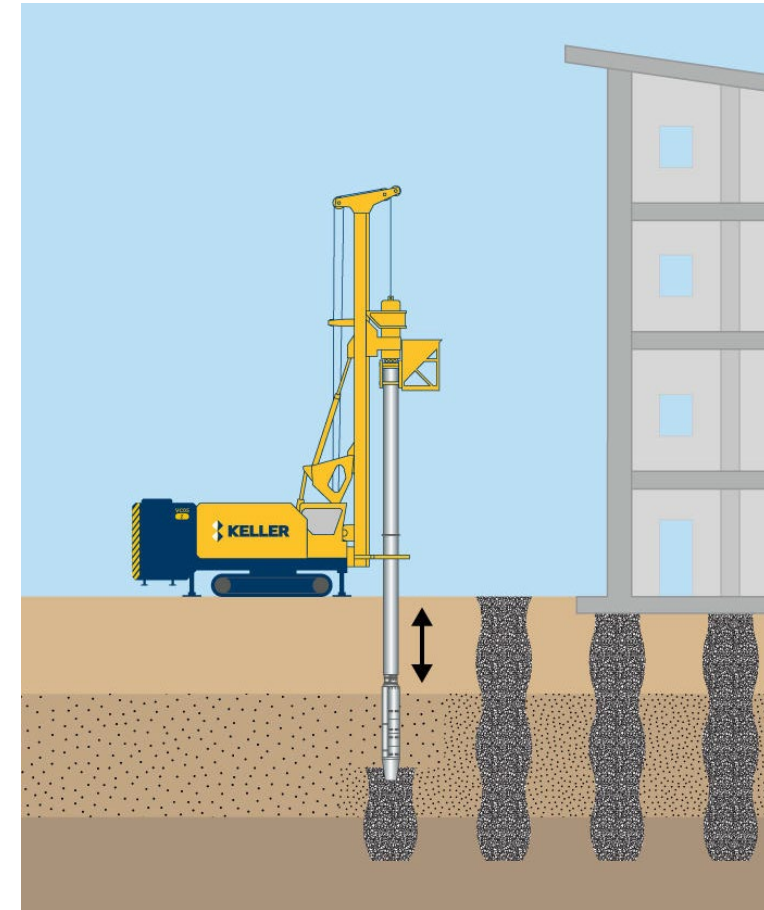


P3 Engineering Design Considerations

- **Design Goals:**
 - **Design a structure with a 200-year service life**
 - **Maximize use of RR right-of-way**
 - **Minimize disruptions to train operations**
 - **Standardize maintenance and minimize maintenance costs**
 - **Utilize company forces and fabrication capabilities where feasible**
- **Service Life Considerations:**
 - Cooper E-90 loading
 - Structure Types – concrete v. steel
- **Maximize ROW:**
 - Widen embankments
 - Full height retaining walls
- **Minimize Disruptions:**
 - Structure types – viaduct vs. retained
 - Temporary work – track and signal
 - Alignment of Shoofly
 - Maximized ROW for access and maintenance
- **Standardize design elements**

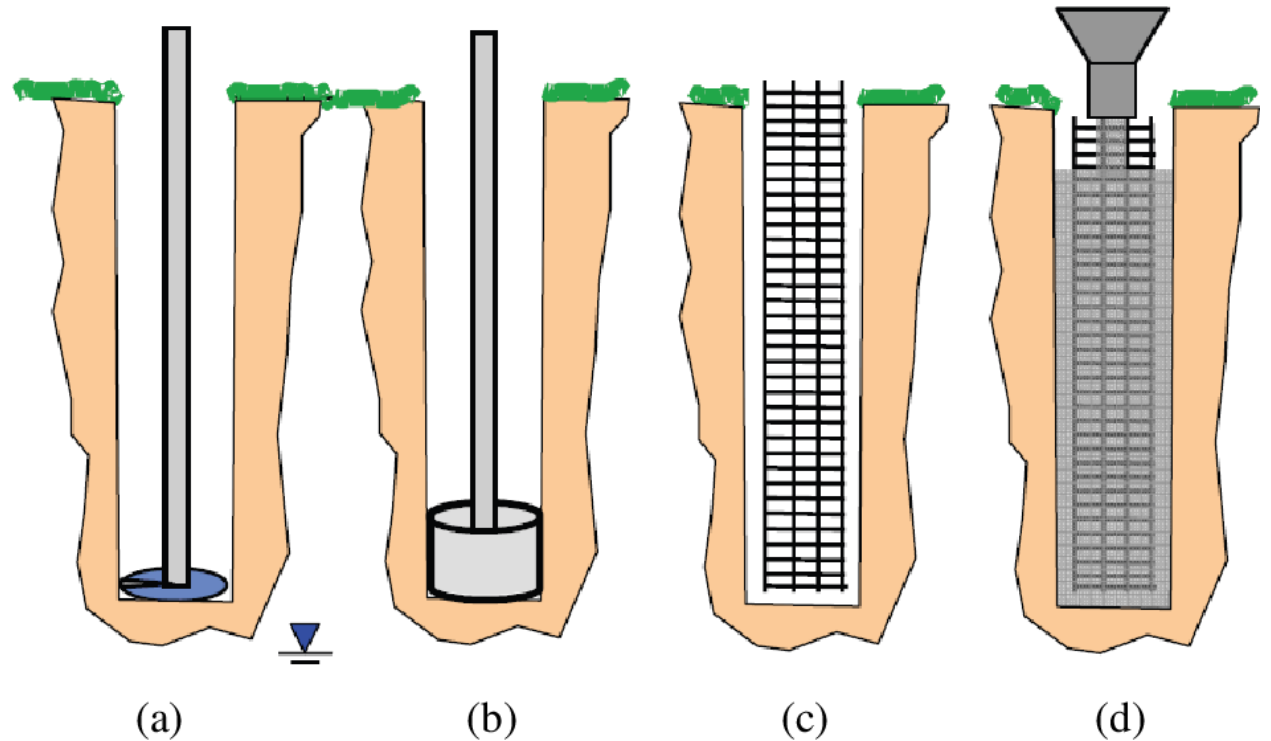
Geotechnical Design

- **Soil Borings – the why and what:**
 - Why are they done?
 - To understand what the team is working with below grade
 - What was discovered?
 - Native soils had low bearing strength
 - High clay content
 - High plasticity
 - These conditions necessitated foundation soil conditioning in select areas using compacted aggregated columns



Substructure Design

- **Three separate structures:**
 - 69th Street RR overpass
 - 71st Street RR overpass
 - Railroad flyover
- **Designed for Cooper E-90 Loading:**
 - Maximize future resiliency while minimizing functional constraints
- **Foundation Type - Drilled Shafts**
 - Multiple diameters for different applications
 - Railroad Flyover:
 - 36 in - for bent walls
 - 48 in & 54 in - for bent columns
 - 69th Street RR Overpass
 - 66 in - for bridge abutments
- **Temporary Earth Retention Systems (ERS)**
 - H-pile and lagging for stage line walls and sheet pile for ERS at bridge abutments



Superstructure Design

- **Deck Plate Girders (DPG)**
 - Utilized CSX standard design for approach spans
 - Simplifies future maintenance and repairs
 - Allowed for CSX to fabricate 28 of 38 total spans (73%)
 - Ship to jobsite via rail car
 - Primary flyover spans fabricated by contractor



Retaining Walls

- **Allowed CSX to maximize our right-of-way and provide for an access road at the new elevation**
- **Mimics at-grade conditions**
- **Track can be maintained by Maintenance of Way (MOW) employees with standard equipment**
- **Minimizes the viaduct structures requiring accessibility for annual inspection program**
 - Improves safety for CSX bridge inspectors by reducing risks associated with inspections - track time, climbing, environment, etc.
- **Selected the proprietary T-Wall system by The Reinforced Earth Company**



Stormwater Management

- **Designed as open channel swales wherever possible for simplified maintenance.**
- **Designed to accommodate drainage for non-CSX properties.**
 - Drainage improvements in SE quadrant have significant benefit to the adjacent residential neighborhood.
- **Design provides detention near existing diamonds which were oversized to accommodate anticipated drainage needs for the future EW2 project.**
- **Design to meet City of Chicago Department of Buildings criteria.**
 - Includes connection to City of Chicago storm sewers at multiple locations.

P3 75th Street Interlocking – Starting Condition



P3 75th Street Interlocking – Proposed Condition



P3 75th Street Interlocking – Current Condition

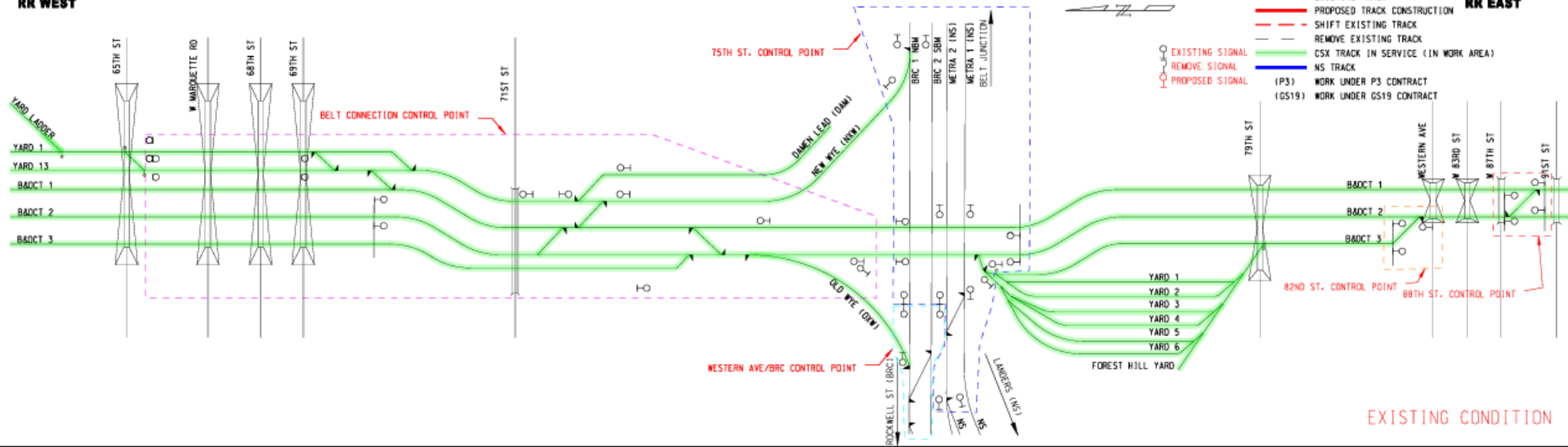




P3 Construction Phasing

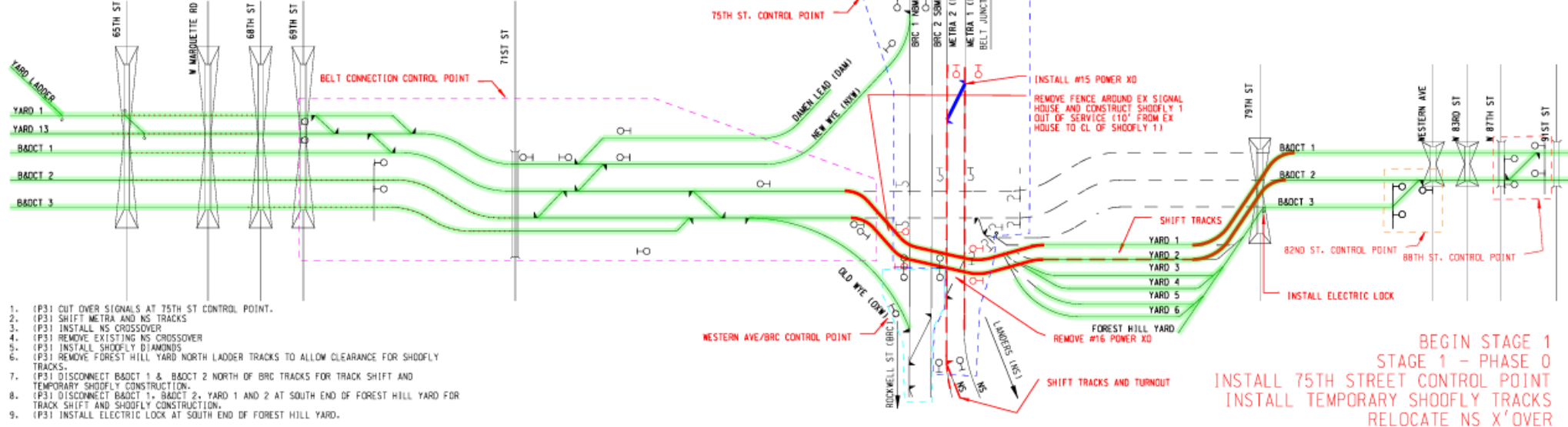
CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST



CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST

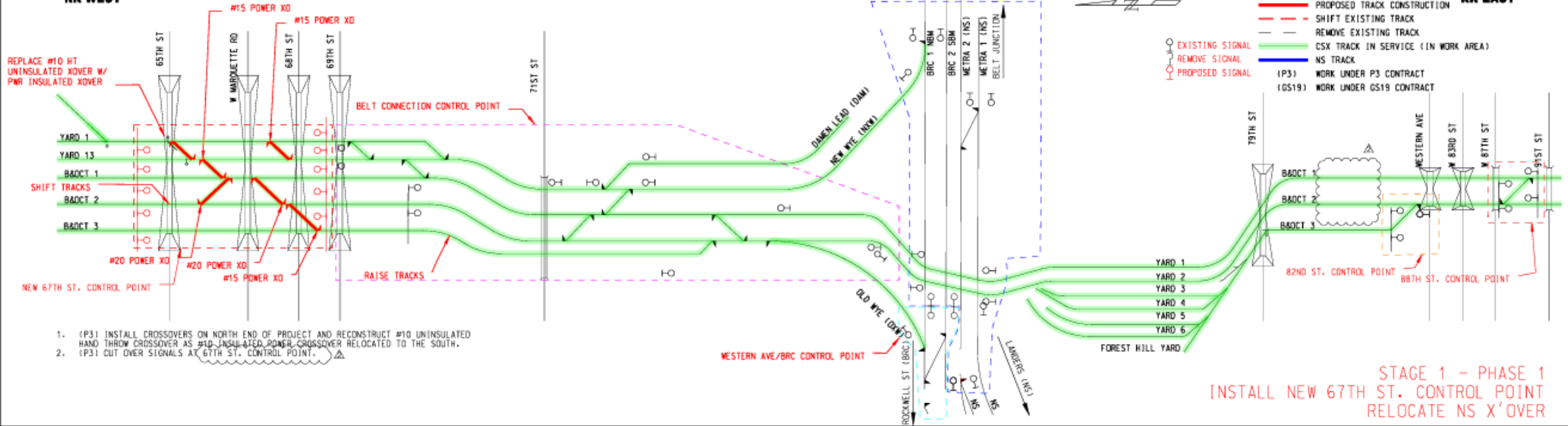


1. (P3) CUT OVER SIGNALS AT 75TH ST CONTROL POINT.
2. (P3) SHIFT METRA AND NS TRACKS
3. (P3) INSTALL NS CROSSOVER
4. (P3) REMOVE EXISTING NS CROSSOVER
5. (P3) INSTALL SHOOFLY DIAMONDS
6. (P3) REMOVE FOREST HILL YARD NORTH LADDER TRACKS TO ALLOW CLEARANCE FOR SHOOFLY TRACKS.
7. (P3) DISCONNECT BA0CT 1 & BA0CT 2 NORTH OF BRC TRACKS FOR TRACK SHIFT AND TEMPORARY SHOOFLY CONSTRUCTION.
8. (P3) DISCONNECT BA0CT 1, BA0CT 2, YARD 1 AND 2 AT SOUTH END OF FOREST HILL YARD FOR TRACK SHIFT AND SHOOFLY CONSTRUCTION.
9. (P3) INSTALL ELECTRIC LOCK AT SOUTH END OF FOREST HILL YARD.

BEGIN STAGE 1
STAGE 1 - PHASE 0
INSTALL 75TH STREET CONTROL POINT
INSTALL TEMPORARY SHOOFLY TRACKS
RELOCATE NS X'OVER

CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST

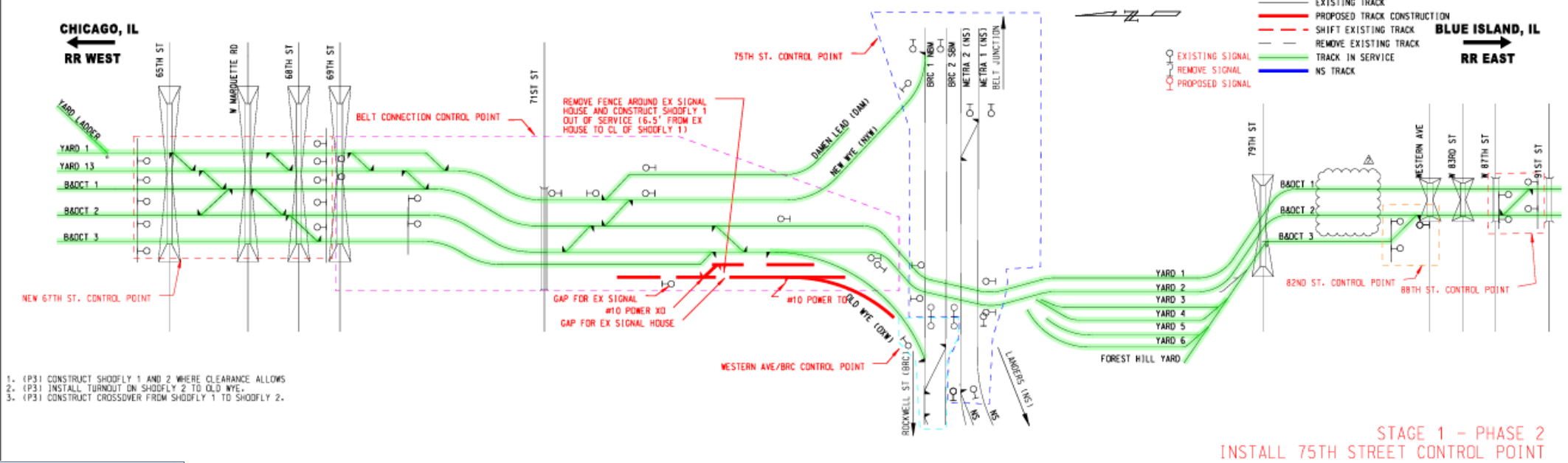


1. (P3) INSTALL CROSSOVERS ON NORTH END OF PROJECT AND RECONSTRUCT #10 UNINSULATED HAND THROW CROSSOVER AS #10 UNINSULATED POWER CROSSOVER RELOCATED TO THE SOUTH.
2. (P3) CUT OVER SIGNALS AT 67TH ST. CONTROL POINT.

STAGE 1 - PHASE 1
INSTALL NEW 67TH ST. CONTROL POINT
RELOCATE NS X'OVER

CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST



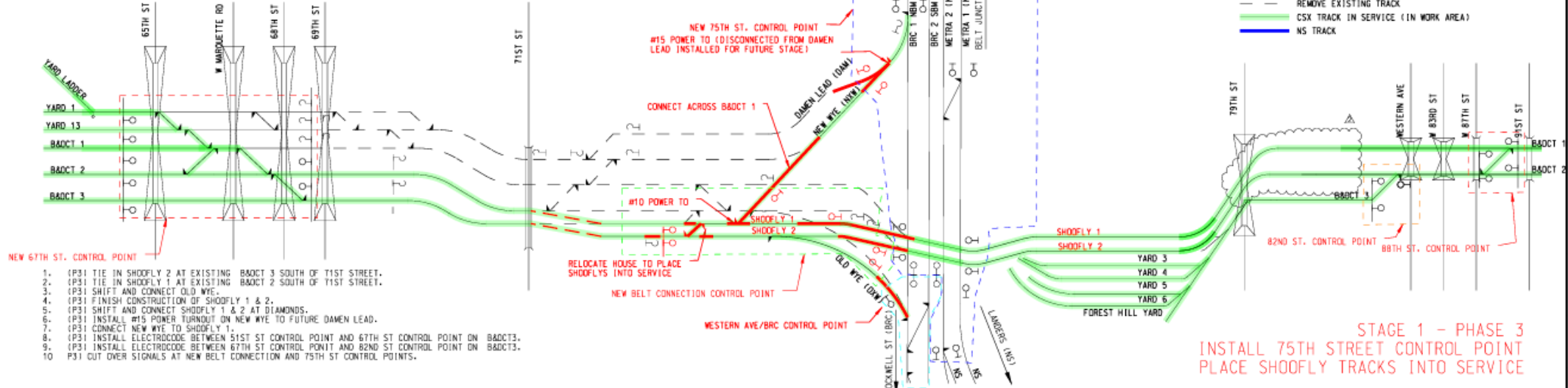
1. (P3) CONSTRUCT SHOOFLY 1 AND 2 WHERE CLEARANCE ALLOWS
2. (P3) INSTALL TURNOUT ON SHOOFLY 2 TO OLD NYE.
3. (P3) CONSTRUCT CROSSOVER FROM SHOOFLY 1 TO SHOOFLY 2.

STAGE 1 - PHASE 2
INSTALL 75TH STREET CONTROL POINT

CHICAGO, IL
← RR WEST

BLUE ISLAND, IL
→ RR EAST

- EXISTING TRACK
- PROPOSED TRACK CONSTRUCTION
- - - SHIFT EXISTING TRACK
- - - REMOVE EXISTING TRACK
- CSX TRACK IN SERVICE (IN WORK AREA)
- NS TRACK

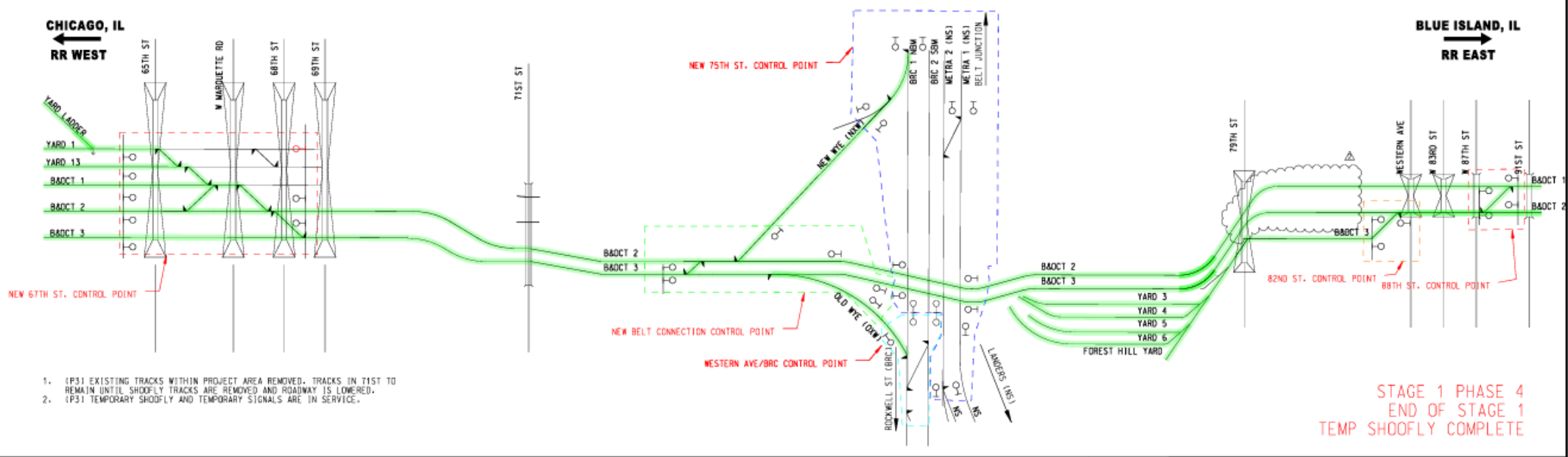


1. (P3) TIE IN SHOOFLY 2 AT EXISTING BADCT 3 SOUTH OF 71ST STREET.
2. (P3) TIE IN SHOOFLY 1 AT EXISTING BADCT 2 SOUTH OF 71ST STREET.
3. (P3) SHIFT AND CONNECT OLD WYE.
4. (P3) FINISH CONSTRUCTION OF SHOOFLY 1 & 2.
5. (P3) SHIFT AND CONNECT SHOOFLY 1 & 2 AT DIAMONDS.
6. (P3) INSTALL #15 POWER TURNOUT ON NEW WYE TO FUTURE DAMEN LEAD.
7. (P3) CONNECT NEW WYE TO SHOOFLY 1.
8. (P3) INSTALL ELECTROCODE BETWEEN 51ST ST CONTROL POINT AND 67TH ST CONTROL POINT ON BADCT3.
9. (P3) INSTALL ELECTROCODE BETWEEN 67TH ST CONTROL POINT AND 82ND ST CONTROL POINT ON BADCT3.
10. (P3) CUT OVER SIGNALS AT NEW BELT CONNECTION AND 75TH ST CONTROL POINTS.

STAGE 1 - PHASE 3
INSTALL 75TH STREET CONTROL POINT
PLACE SHOOFLY TRACKS INTO SERVICE

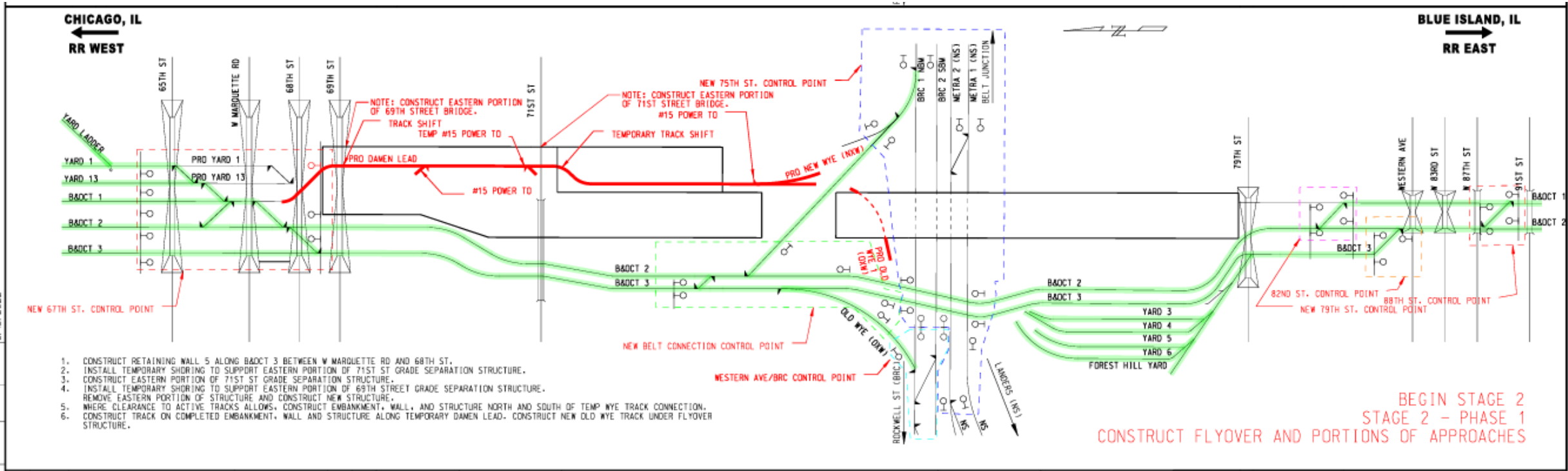
CHICAGO, IL
← RR WEST

BLUE ISLAND, IL
→ RR EAST



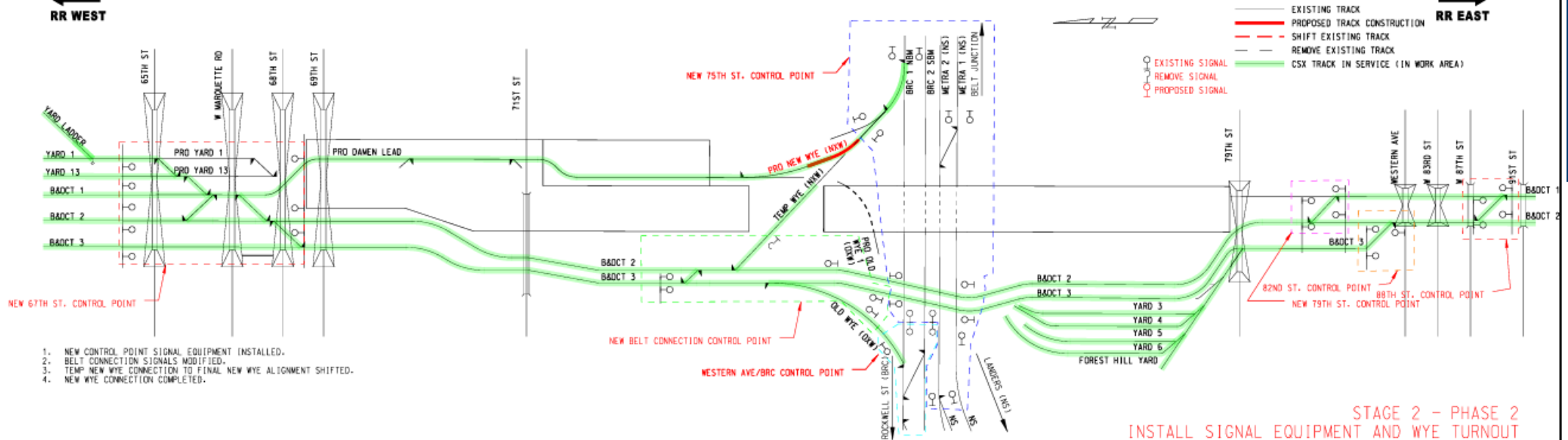
1. (P3) EXISTING TRACKS WITHIN PROJECT AREA REMOVED. TRACKS IN 71ST TO REMAIN UNTIL SHOOFLY TRACKS ARE REMOVED AND ROADWAY IS LOWERED.
2. (P3) TEMPORARY SHOOFLY AND TEMPORARY SIGNALS ARE IN SERVICE.

STAGE 1 PHASE 4
END OF STAGE 1
TEMP SHOOFLY COMPLETE



CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST

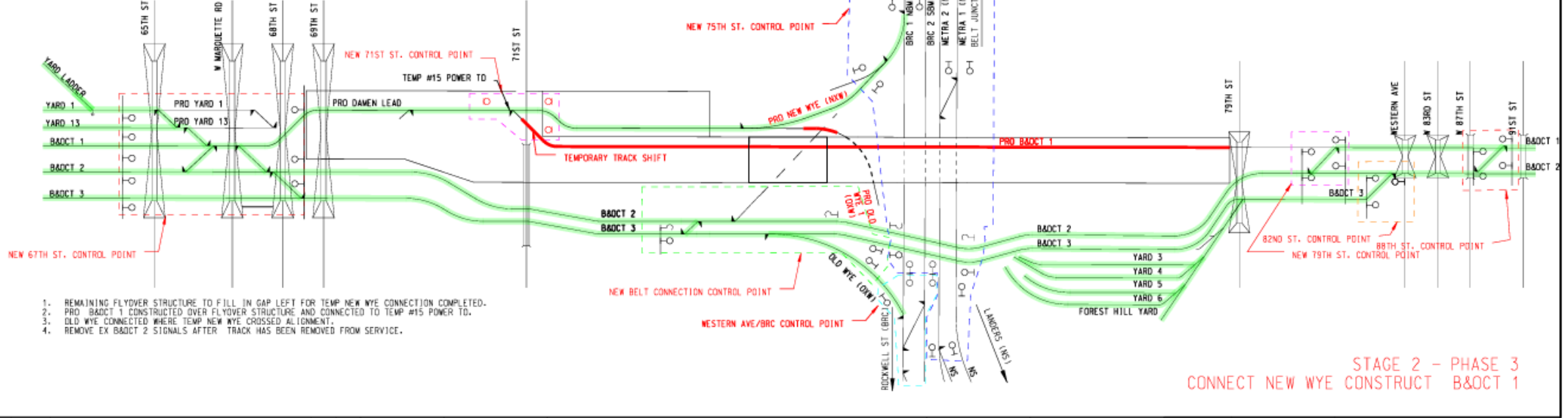


1. NEW CONTROL POINT SIGNAL EQUIPMENT INSTALLED.
2. BELT CONNECTION SIGNALS MODIFIED.
3. TEMP NEW WYE CONNECTION TO FINAL NEW WYE ALIGNMENT SHIFTED.
4. NEW WYE CONNECTION COMPLETED.

STAGE 2 - PHASE 2
INSTALL SIGNAL EQUIPMENT AND WYE TURNOUT

CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST

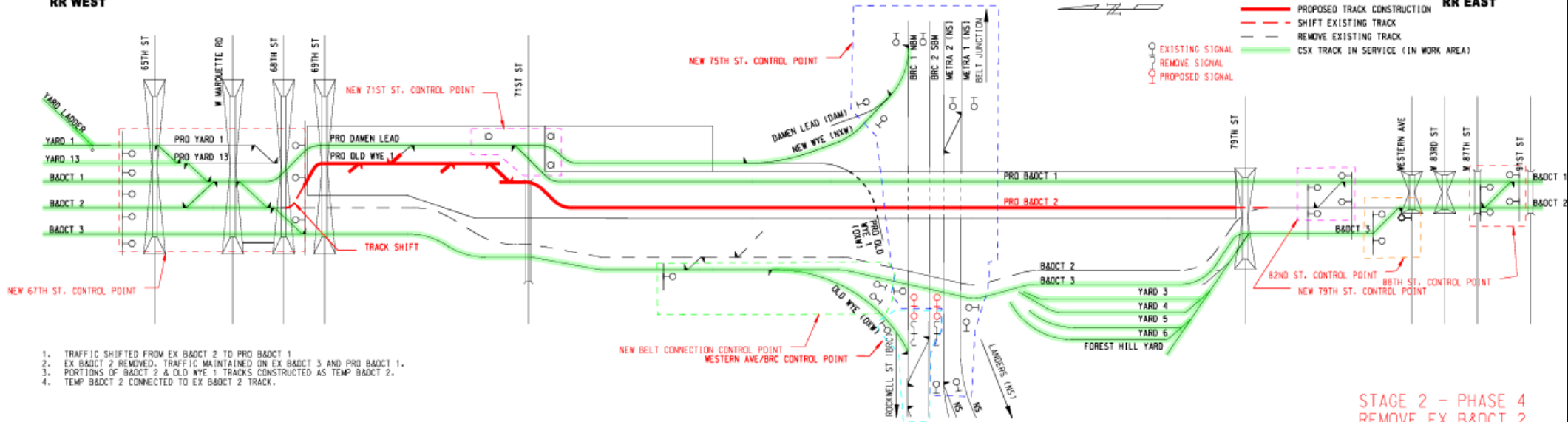


1. REMAINING FLYOVER STRUCTURE TO FILL IN GAP LEFT FOR TEMP NEW WYE CONNECTION COMPLETED.
2. PRO B&OCT 1 CONSTRUCTED OVER FLYOVER STRUCTURE AND CONNECTED TO TEMP #15 POWER TD.
3. OLD WYE CONNECTED WHERE TEMP NEW WYE CROSSED ALIGNMENT.
4. REMOVE EX B&OCT 2 SIGNALS AFTER TRACK HAS BEEN REMOVED FROM SERVICE.

STAGE 2 - PHASE 3
CONNECT NEW WYE CONSTRUCT B&OCT 1

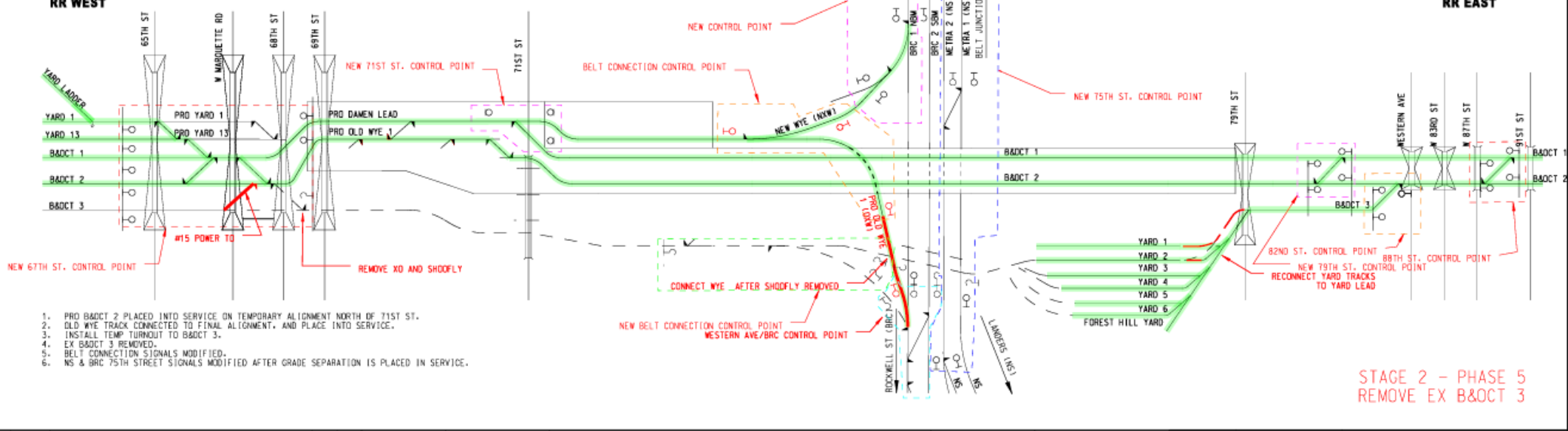
CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST



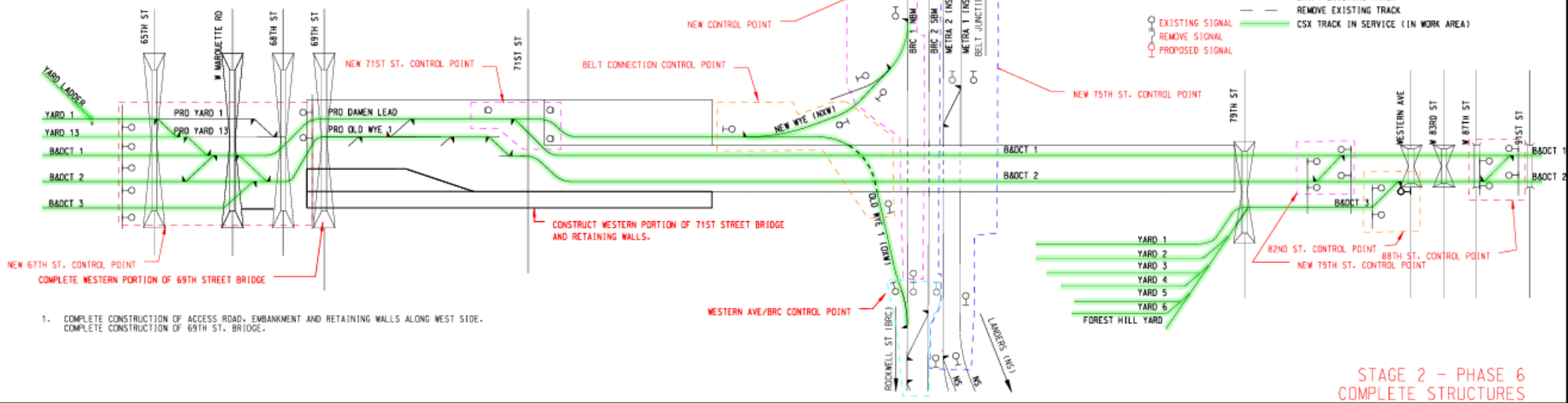
CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST



CHICAGO, IL
RR WEST

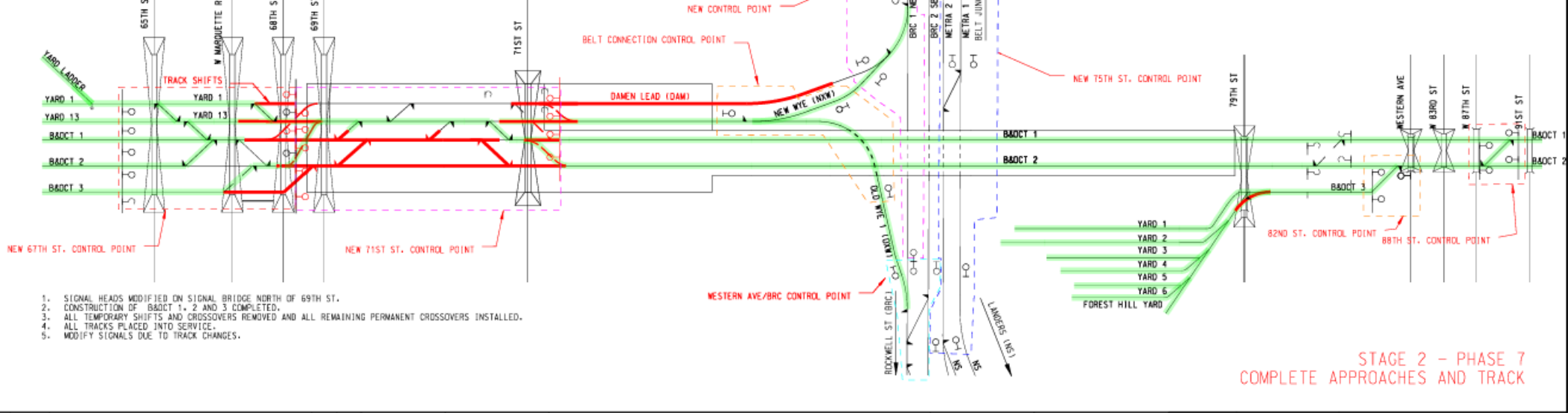
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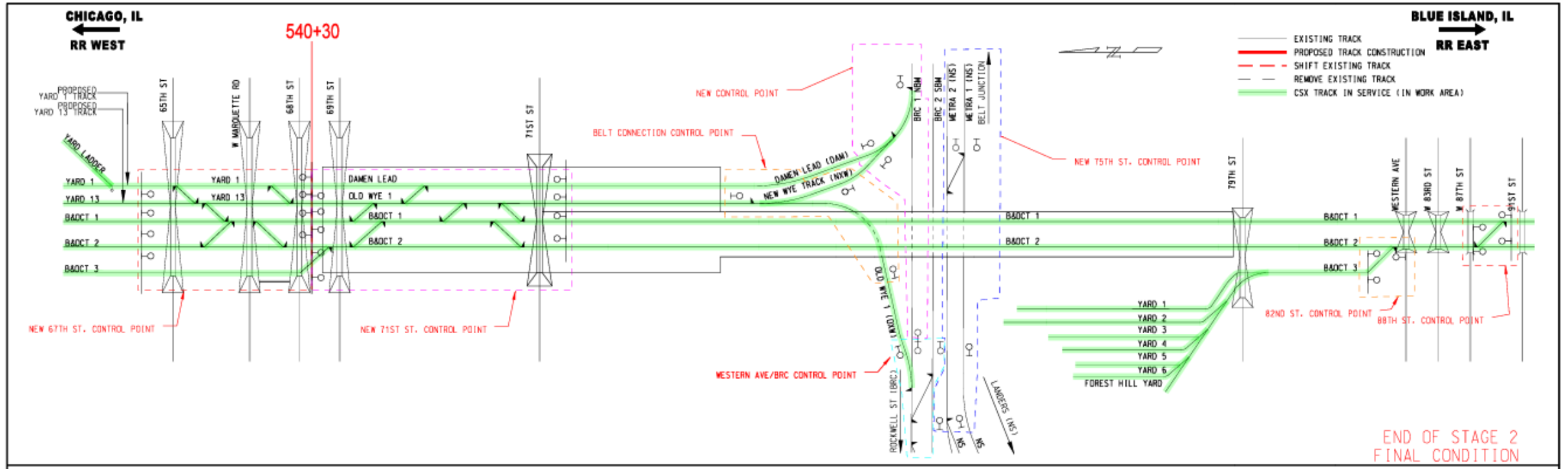
STAGE 2 - PHASE 6
COMPLETE STRUCTURES

CHICAGO, IL
RR WEST

BLUE ISLAND, IL
RR EAST



STAGE 2 - PHASE 7
COMPLETE APPROACHES AND TRACK





Q&A



C R E A T E

KEEPING THE **GO** IN CHICAGO



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