CLOCK TOWER FEASIBILITY STUDY
(DRAFT)

CITY OF SPOKANE PARKS AND RECREATION DEPARTMENT
RIVERFRONT PARK CLOCK TOWER
SPOKANE, WASHINGTON

INTEGRUS PROJECT NO. 21346.00

PREPARED FOR:

CITY OF SPOKANE PARKS AND RECREATION DEPARTMENT
808 W. SPOKANE FALLS BLVD., 5TH FLOOR
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FEBRUARY 14, 2014

SECTION 1
INTRODUCTION

Riverfront Park Clock Tower Feasibility Study

The purpose of this report is to analyze the possibility of providing public access to an observation platform above the clockworks. This effort will review the potential structural, aesthetic, and code impacts of some example strategies for means of access and egress. We understand the intended outcome of this effort is to provide the City of Spokane Parks and Recreation Department with information and options to review with regards to cost and general viability of opening the Clock Tower for public use.

At the current time, the Clock Tower is accessed once per week in order to rewind the clock mechanism. Additional access is made infrequently as other routine maintenance demands arise. Our Feasibility Study and recommendations assume no changes to this current usage; however, it does include a change of occupancy use to allow public access to the observation level above the current clockworks level.

Executive Summary

A listing of our design options, structural and code analysis is included in the body of the report. Below is a summary of our recommendations.

- Graphic 1-01 and 2-01 describes our recommendation to provide public access to an observation deck in the Clock Tower. Access is accomplished through a series of stairs routed through the existing floor levels, around the clockworks, and ending in a glass enclosed observation level. Several constraints for this option exist and are discussed further in this report.

- In all options that were studied, modifications to the clockwork mechanism were necessary. Due to geometric constraints, at least two of the clock drive shafts, and the clock counter weight would need to be relocated to allow stairway access. Locating a qualified expert for this work may be a constraint and should be accomplished as a part of further study. As an option to avoid this relocation, the clocks on the affected faces could instead become inactive. (See graphic 1-03 and 2-03)

- We recommend providing a security enclosure for the clockworks and protection of the drive shafts and counter weight to prevent the public from disturbing or vandalizing the mechanisms. The visual impact of these measures will need to be explored.

- At the observation level, we recommend installation of storefront laminated glass on the inside of existing masonry openings at all sides of the observation deck.

- Code issues such as ADA accessibility, exiting, fire protection or sprinklers and other safety or code concerns discovered during our research will need to be addressed with building and fire code officials for approval. This is beyond the scope of this report.

- We suggest that the Owner verify whether or not the Clock Tower is on a state or national historic preservation registry, which would affect the code requirements for accessibility, code review process, and what alteration work may be done. We also recommend that a historical report be provided to the code official in order for the modifications and change of use to be reviewed under the International Existing Building Code (IEBC), Chapter 12 and Appendix B.

- As a part of the design effort, a full structural analysis will need to be performed on the Clock Tower.

Background Information

Integrus Architecture, P.S. was contacted in the fall of 2011 to perform a conditions assessment on the core facilities in Riverfront Park. The intent of that effort was to define the current condition of these facilities in regard to safety, current performance, and future potential. The Clock Tower structure is included in the overall scope. In February through March of 2012 Integrus Architecture, P.S. completed a Structural and Maintenance Access Assessment Report. As a follow-up to this work Integrus Architecture, P.S. was asked to explore the feasibility of opening the Clock Tower to the public as venue for an observation deck.

This report assumes that the additional requirements of the 2012 International Building Code and the 2012 International Existing Building Code would apply to this structure due to the historical designation and limited nature of the required access. Verification of this assumption was requested from the Spokane Building Services Department. At the writing of this report, however, no code interpretation was yet available.

Known History of Building Structure

The Clock Tower was built in 1902 as part of the three-story Burlington Northern Railway Station. In 1973 the Burlington Northern Railway Station was demolished, leaving only the Clock Tower. At this time, a number of the openings in the exterior walls were in filled with concrete masonry unit blocks. At the west, north, and east sides, where the Burlington Northern Railway Station used to connect to the tower, additional exterior brick facade was also installed. New openings were cut into the concrete elevator shaft wall at the first level.

At some point in the past, the flat roof at the seventh level, over the clock leaked for a number of years. On-site we were told it was allowed to leak for approximately three to four years. To repair the damage from the water leak, it appears that the seventh level roof wood planks, the roofing, two wood beams at the roof, and one wood beam at the sixth level were replaced.

General Description of Existing Building Structure

Square in plan, the tower consists of eight levels and is approximately 155 feet tall. The exterior walls are load bearing, unreinforced, built-up clay masonry brick walls. Steel members were observed embedded in the west, north, and south exterior walls on the bottom three levels. There is an elevator shaft with three 8-inch concrete walls that extend up the north side of the tower from the ground to the fifth level, where the shaft has a concrete lid. The elevator was removed with the 1973 renovations, and all access openings at the upper levels were in filled with concrete masonry units (CMU).

The foundation system is unknown. There is a trench that runs east-west through the center of the tower below the ground slab. The trench has mortar bound stonewalls. The north entryway into the Clock Tower appears to have been installed with the 1973 renovations along with a new penetration to the south 8-inch concrete elevator shaft wall.

The second, third, and fourth levels have clay brick arches that span between the exterior walls and three steel beams extending across the floors (see Photo B). The shape of the steel beams are unknown, as only the bottom flange and/or plate is exposed to view. The floor total depth varies from 16" to 12". The fourth level has tongue and groove wood planks over a built-up wood floor on top of the clay brick and steel beam system.

Wood planks span over timber beams supported by the exterior walls at the fifth, sixth, and seventh levels. The fifth level has tongue and groove wood planks. The sixth level houses the clock mechanism and has nine foot diameter penetrations in all four exterior walls for the clock face. The seventh level acts as a roof over the floors below. The walls and roof are exposed to weather. The roof planks, roofing material, and two beams were replaced with the water leak repair.

Above the seventh level is a pyramid shaped roof supported by two round stone piers on each exterior wall and the brick exterior walls that continue up at the corners. We were not able to gain access up to the attic to inspect the steeple roof supports.

The lateral resisting elements of the structure are the exterior built-up brick walls and the elevator concrete shaft walls.

SECTION 2
OPTION 1 ANALYSIS

General Description of Design Option 1

The purpose of Design Option 1 is to leave most of the existing floors in place for structural and historical preservation reasons. Additional bracing and support can be added at each floor as needed to accommodate the stairway design. A secure access point from the stairway to the clockworks level should be provided for maintenance, and designed to restrict public entry. In Design Option 1, the stairway conflicts with one clock face drive shaft, which means that shaft would have to be rerouted or that face made inactive. Where the stairway transitions through the clockworks level, we recommend a Plexiglas or laminated glass "wall" to be built that allows views but also limits the public from touching or vandalizing the clockwork mechanisms and rods. The electronic speakers and lighting at the observation level would have to be modified if laminate glass walls were constructed. Speakers and lighting could be mounted on, above or below a portion of the laminated glass walls to allow the sound to project outside the tower and for lighting at night. The laminated glass enclosure has the advantages of providing weather protection and occupant safety, while not obstructing views, and not adversely affecting the appearance to outside observers. Potential code issues such as ADA accessibility, exiting, fire protection or sprinklers and other safety or code concerns would need to be addressed with building and fire code officials for approval, which is beyond the scope of this report.

Structural Analysis and Recommendations

The intent of Design Option 1 is to leave as much of the existing floor structure intact as possible, while providing a stair which meets the Building Code requirements. This limited impact on existing structure may preclude the need for a more comprehensive seismic evaluation. This design option introduces a back and forth "scissor-type" stair up through the center of the building to the fifth level. The stair configuration would then change to a stair which wraps around the inside of the exterior walls to miss the clock pendulum and counterweight. Refer to Sheets S101 through S109 for conceptual plans, sections and an isometric view.

The stairs would be steel framed with channel stringers and concrete-filled steel pans for treads. Many of the stair stringers would turn horizontal at intermediate landings and extend to the exterior brick wall for support. Landings would typically have a 4" thick composite deck (2-1/2" concrete over 1-1/2" metal deck).

Advantages

- Less demolition of existing floor structures.
- Existing floors can be used as staging areas to erect new stair runs above.

Disadvantages

- One clock drive shaft will need to be reconfigured to avoid stair.
- Due to limited space and access through floors, it will be difficult to prefabricate stair runs.
- Lighting at level six will need to be modified to avoid shadow of stair structure on clock face.

Code Analysis

Code analysis is based on the 2012 International Codes with references to the International Building and Existing Building Codes. This analysis is based on maintaining the existing second, third, and fourth floors which have clay brick arches that span between exterior walls and three steel beams. These floors meet the one-hour fire rated assembly required by IBC Table 601 for construction Type III-A.

- Public access stairs and landings should be constructed of steel with a fire-rated paint or coating for protection. Structural steel framing and bracing can be added beneath the existing wood floors to provide additional support for occupant live loads.
- One of the first potential code issues is ADA accessibility as defined by the International Building Codes, which could require a site accessible route to the Clock Tower and an elevator up to the observation level. If the Clock Tower public access project can be reviewed under the International Existing Building Code, Chapter 12, for historic buildings, the ADA accessibility requirements could be waived if there is justification that it would threaten or destroy the historic significance of the building.
- If an elevator was installed for accessibility and/or public use it would have to meet IBC Code Requirements for shaft enclosure construction separate from a stairway, provide a separate elevator machine room, controls, electrical, mechanical, ventilation of the shaft, fire-fighter emergency operation, smoke detectors, back-up power, and possibly automatic fire sprinklers etc.
- Another code concern is exiting distance limits which could require the provision of an automatic fire sprinkler system.

General International Building Code Requirements

- Based on IBC Section 303.4, the occupancy use and classification is assembly group A-3.
- Section 602.3: Construction is Type III-A: Exterior walls are of noncombustible materials (brick/concrete) and interior building elements (wood framed floors) are of any materials permitted by this (2012) code.
- Table 601 Fire-Resistance Rating Requirements: Floor and roof construction shall be one-hour rated based on Construction Type III-A.
- Section 1015 Exit and Exit Access Doorways: The building occupant load is limited to 49 people maximum in accordance with Table 1015.1, spaces with one exit or exit access doorway, and an A-3 occupancy group.
- Section 1004.3: The occupant load is required to be posted in a conspicuous place near the main access or exit. Sign shall be an approved legible permanent design maintained by the Owner.
- Section 1007.1 Accessible Means of Egress, Exception 1: Accessible means of egress is not required in alterations to existing buildings.
- Chapter 11 Accessibility, Section 1103.2.7 Raised Areas: Raised areas used primarily for purposes… of observation galleries…are not required to be accessible or served by an accessible route.

IBC Means of Egress (Stairway) Code Requirements

- Section 1006.1: Lighting is required at the means of egress (stairway), including the exit discharge (doorways), shall be illuminated at all times while the building is occupied.
- Section 1008.1.6: Landings at doors, and stairs, shall have a width not less than the width of stairs. Landings shall have a length measured in the direction of travel not less than 44 inches.
- Section 1009.4: Stairways shall be 44 inches clear width between stair handrails.
- Section 1009.5: Headroom clearances of 80 inches (6'-8") minimum vertically from edge of stair nosing and min. clear width shall be maintained the full width of the stairway and landings.
- Section 1009.7.2: Stair riser height shall be limited to 7 inches max. and 4 inches min. The tread depth shall be 11 inches min.
- Section 1009.7: Width of stair landings shall have a min. width equal to the stairway measured perpendicular to the direction of travel.
- Section 1009.10: A flight of stairs shall not have a vertical rise greater than 12 feet between floors or landings.
- Section 1009.12 Spiral Stairways: Spiral stairs are permitted to be used as a component in the means of egress only within dwelling units or from a space not more than 250 square feet in area and not serving more than five occupants.
- Section 1012 Handrails: Typical handrail code requirements apply.
- Section 1013 Guards: Typical guard and guardrail code requirements apply. Guards shall not be less than 42 inches high measured vertically from walking surfaces and on stairs, from the line connecting the leading edges of tread nosings.
- Section 1014 Exit Access, Table 1014.3 Common Path of Egress Travel shall not exceed a distance of 75 feet in occupancy A-3, without a sprinkler system, and an occupant load of 30 (49) or more.
- Section 1016 Exit Access Travel Distance, Table 1016.2: In occupancy A-3, without a fire sprinkler system, travel distance is limited to 200 feet max. Section 1016.3 Measurement: Exit access travel distance shall be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit.
- Table 1016.2 Exit Access Travel Distance: Occupancy A-3 with a fire sprinkler system, travel distance can be limited to 250 feet max., (note b) if the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
- Section 1021 Number of Exits and Exit Configuration, Table 1021.2(2) Stories with One Exit or Access to One Exit for Other Occupancies: First story or Basement: A-3 occupancy with 49 people max. is limited to an exit access travel distance of 75 feet.

Fire Protection Systems, Chapter 9

- Section [F] 903.3.1.1 NFPA 13 sprinkler systems: Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.
- Section [F] 903.3.1.1.1 Exempt locations: Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.
  1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
  2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.

- Section [F] 907.2 Where required—new buildings and structures. An approved fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.
- A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Elevators and Conveying Systems, Chapter 30

- Section 3002.1 Hoistway Enclosure Protection: Elevator, dumbwaiter and other hoistway enclosures shall be shaft enclosures complying with Section 713.
- Section [F] 3003.2 Fire-Fighters' Emergency Operation: Elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1/CSA B44.
- Section [F] 3003.3 Standardized Fire Service Elevator Keys: All elevators shall be equipped to operate with a standardized fire service elevator key in accordance with the International Fire Code.
- Section 3004.1 Vents Required: Hoistways of elevators and dumbwaiters penetrating more than three stories shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.
- Section 3006.1 (Machine Rooms) Access: An approved means of access shall be provided to elevator machine rooms and overhead machinery spaces.
- Section 3006.2 (Machine Room) Venting: Elevator machine rooms that contain solid-state equipment for elevator operation shall be provided with an independent ventilation or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be capable of maintaining temperatures within the range established for the elevator equipment.
- Section 3006.3 (Machine Room) Pressurization: The elevator machine room serving a pressurized elevator hoistway shall be pressurized upon activation of a heat or smoke detector located in the elevator machine room.
- Section 3006.4 Machine Rooms and Machinery Spaces: Elevator machine rooms and machinery spaces shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.
- Section 3007.1 General: Where required by Section 403.6.1, every floor of the building shall be served by fire service access elevators complying with Sections 3007.1 through 3007.10. Except as modified in this section, fire service access elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.
- Section 3007.2 Phase I Emergency Recall Operation: Actuation of any building fire alarm-initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position, key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby, hoistway or elevator machine room smoke detectors. In addition, if the building also contains occupant evacuation elevators in accordance with Section 3008, an independent, three-position, key-operated "Fire Recall" switch conforming to the applicable requirements in ASME A17.1/CSA B44 shall be provided at the designated level for each fire service access elevator.

ICC ANSI A117.1-2009 Chapter 4, Section 408 Limited Use/Limited Application Elevators

- Section 408.1 General: Limited-use/limited-application elevators shall comply with Section 408 and ASME A17.1/CSA B44 listed in Section 105.2.5. Elevator operation shall be automatic.
- Section 408.2 Elevator Landing Requirements: Landings serving limited-use/limited application elevators shall comply with Section 408.2.
- Section 408.3 Elevator Door Requirements: Elevator hoistway doors shall comply with Section 408.3.
- Section 408.3.1 Sliding Doors: Sliding hoistway and car doors shall comply with Sections 407.3.1 through 407.3.3, and 408.3.3.
- Section 408.3.3.1 Cars with Single Door or Doors on Opposite Ends: Car doors shall be positioned at the narrow end of cars with a single door and on cars with doors on opposite ends. Doors shall provide a clear opening width of 32 inches (815 mm) minimum.
- Section 408.4 Elevator Car Requirements: Elevator cars shall comply with Section 408.4. Section 408.4.1 Inside Dimensions: Elevator cars shall provide a clear floor width of 42 inches (1065mm) minimum. The clear floor area shall not be less than 15.75 square feet (1.46m^2).
- EXCEPTION: For installations in existing buildings, elevator cars that provide a clear floor area of 15 square feet (1.4m^2) minimum, and provide a clear inside dimension of 36 inches (915mm) minimum in width and 54 inches (1370mm) minimum in depth, shall be permitted. This exception shall not apply to cars with doors on adjacent sides.

- Section 408.4.3 Platform to Hoistway Clearance: The clearance between the car platform sill and the edge of any hoistway landing shall comply with ASME A17.1/CSA B44 listed in Section 105.2.5.
- Section 408.4.8 Emergency Communications: Car emergency signaling devices complying with Section 407.4.10 shall be provided.

International Existing Building Code, Chapter 12 Historic Buildings

- Section [B] 1201.2 Report: A historic building undergoing repair, alteration, or change of occupancy shall be investigated and evaluated. If it is intended that the building meet the requirements of this chapter, a written report shall be prepared and filed with the code official by a registered design professional when such a report is necessary in the opinion of the code official. Such report shall be in accordance with Chapter 1 and shall identify each required safety feature that is in compliance with this chapter and where compliance with other chapters of these provisions would be damaging to the contributing historic features.
- Section 1202.4 Replacement glazing in hazardous locations shall comply with safety glazing requirements of the IBC Chapter 24. (If laminated glass is added at the view level/floor to enclose the area at brick arches).
- Section 1203.3 Means of Egress: Existing door opening widths less than those specified by the IBC or IEBC may be approved, provided that in the opinion of the code official, there is sufficient width and height for a person to pass through. When approved by the code official, the main exit doors need not swing in the direction of exit travel, provided that other approved means of egress with sufficient capacity for the occupant load is provided.
- Section 1203.7 One-Hour Fire-Resistant Assemblies: Where one-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood or metal lath and plaster.
- Section 1205.15 Accessibility Requirements: The provisions of Section 1012.8 shall apply to facilities designated as historic structures that undergo a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet rooms would threaten or destroy the historic significance of the building or facility, as determined by the authority having jurisdiction, the alternative requirements of Sections 1204.1.1 through 1204.1.4 for those elements shall be permitted.

IEBC APPENDIX B Supplementary Accessibility Requirements for Existing Buildings and Facilities

- Section B101.3 Qualified historic buildings and facilities subject to Section 106 of the National Historic Preservation Act: Where an alteration or change of occupancy is undertaken to a qualified historic building or facility that is subject to Section 106 of the National Historic Preservation Act, the federal agency with jurisdiction over the undertaking shall follow the Section 106 process. Where the state historic preservation officer or Advisory Council on Historic Preservation determines that compliance with the requirements for accessible routes, ramps, entrances, or toilet facilities would threaten or destroy the historic significance of the building or facility, the alternative requirements of Section 410.9 for that element are permitted.
- Section [B] 410.9 Historic Buildings: These provisions shall apply to facilities designated as historic structures that undergo alterations or a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, entrances or toilet rooms would threaten or destroy the historic significance of the facility, as determined by the applicable governing authority, the alternative requirements of Sections 410.9.1 through 410.9.4 for that element shall be permitted.

SECTION 3
OPTION 2 ANALYSIS

General Description of Design Option 2

The purpose of Design Option 2 is to remove all existing floors in order to allow for a repetitive stair design adjacent to the exterior walls. New steel famed floors would be added at the clockworks and observation level. The steel stair framing would meet code requirements for fire-rated assemblies and means of egress. A secure access point from the stairway to the clockworks level should be provided for maintenance, and designed to restrict public entry. In Design Option 2, the stairway conflicts with two clock face drive shafts, which means that shafts would have to be rerouted or that two clock faces be made inactive. Where the stairway transitions through the clockworks level, we recommend a Plexiglas or laminated glass "wall" to be built that allows views but also limits the public from touching or vandalizing the clockwork mechanisms and rods. The electronic speakers and lighting at the observation level would have to be modified if laminate glass walls were constructed. Speakers and lighting could be mounted on, above or below a portion of the laminated glass walls to allow the sound to project outside the tower and for lighting at night. The laminated glass enclosure has the advantages of providing weather protection and occupant safety, while not obstructing views, and not adversely affecting the appearance to outside observers. A code limiting factor for the design is exiting distance, which is 200 feet, and if the stair pathway is 200 to 250 feet or more the structure may require an automatic fire sprinkler system. Potential code issues such as ADA accessibility, exiting, fire protection or sprinklers and other safety or code concerns would need to be addressed with building and fire code officials for approval, which is beyond the scope of this report.

Structural Analysis and Recommendations

The intent of Design Option 2 is to remove the existing floor structures completely to allow a regular, repetitive stair system that wraps around the inside of the exterior walls. A new floor would be installed at the clock mechanism level and observation level. The removal of the existing floor levels will impact the way the structure responds to seismic and wind forces and a comprehensive seismic analysis would be necessary to determine if strengthening of the structure is necessary. This analysis is outside the scope of this report. Conservatively, Design Option 2 depicts the use of a supplemental lateral force resisting system (Refer to 2-02). This system would employ ordinary concentrically braced steel frames on the inside of each face of the structure, which would be supported on a concrete "box" structure inside the Clock Tower base between the first and second levels.

At the lower level, new concrete walls would be placed on the inside of the existing brick walls to form the walls of the "box". The lid of the box would be constructed of 5" composite deck (3-1/2" concrete over 1-1/2" metal deck) supported on steel beams. The wrap around stairs would be steel framed with channel stringers and concrete-filled steel pans for treads. Landings would typically have a 4" thick composite deck (2-1/2" concrete over 1-1/2" metal deck). The new framed floors would consist of 5" composite deck (3-1/2" concrete over 1-1/2" metal deck) supported on steel beams.

Advantages

- Regular stair pattern.
- Durable floors at clock and observation levels.
- The layout is amenable to prefabrication of stair runs.

Disadvantages

- Two clock drive shafts will need to be reconfigured to avoid stair.
- Cost.
- Lighting at level six will need to be modified to avoid shadow of stair structure on clock face.

Code Analysis

Code analysis is based on the 2012 International Codes with references to the International Building and Existing Building Codes. This analysis is based on removal of the existing brick/steel floors two through four, the wood framed fifth floor, the clockworks floor and observation floor seven. The clockworks and observation floors would be replaced with a structural steel frame having a one-hour fire rating. The existing wood framed floor at the clockworks level could potentially remain with additional steel supports added beneath as needed for structural support. Since the existing wood attic/roof framing will remain this does not change the overall building construction type from being Type III-A according to IBC Table 601 and Section 602.3.

- Public access stairs and landings should be constructed of steel with a fire-rated paint or coating for protection. A new steel structural frame should be built for the observation deck to provide a fire rated floor assembly, and adequate support for occupant live loads. The existing wood attic/roof framing is 22 feet minimum above the observation floor level, which is more than the 20-foot height limit where additional fire protection may not be required, but that would have to be approved by the fire and building code officials.

All other code comments for means of egress, accessibility, stairs, elevators, and the International Existing Building Code are the similar as listed in this report Section 2, design Option 1.

General International Building Code Requirements

- Based on IBC Section 303.4 the occupancy use and classification is assembly group A-3.
- Section 602.3: Construction is Type III-A: Exterior walls are of noncombustible materials (brick/concrete) and interior building elements (wood framed floors) are of any materials permitted by this (2012) code.
- Table 601 Fire-Resistance Rating Requirements: Floor and roof construction shall be 1-hour rated based on Construction Type III-A.
- Section 1015 Exit and Exit Access Doorways: The building occupant load is limited to 49 people maximum in accordance with Table 1015.1, spaces with one exit or exit access doorway, and an A-3 occupancy group.
- Section 1004.3: The occupant load is required to be posted in a conspicuous place near the main access or exit. Sign shall be an approved legible permanent design maintained by the Owner.
- Section 1007.1 Accessible Means of Egress, Exception 1: Accessible means of egress is not required in alterations to existing buildings.
- Chapter 11 Accessibility, Section 1103.2.7 Raised Areas: Raised areas used primarily for purposes… of observation galleries…are not required to be accessible or served by an accessible route.

SECTION 4
APPENDIX 4.1 PHOTOS

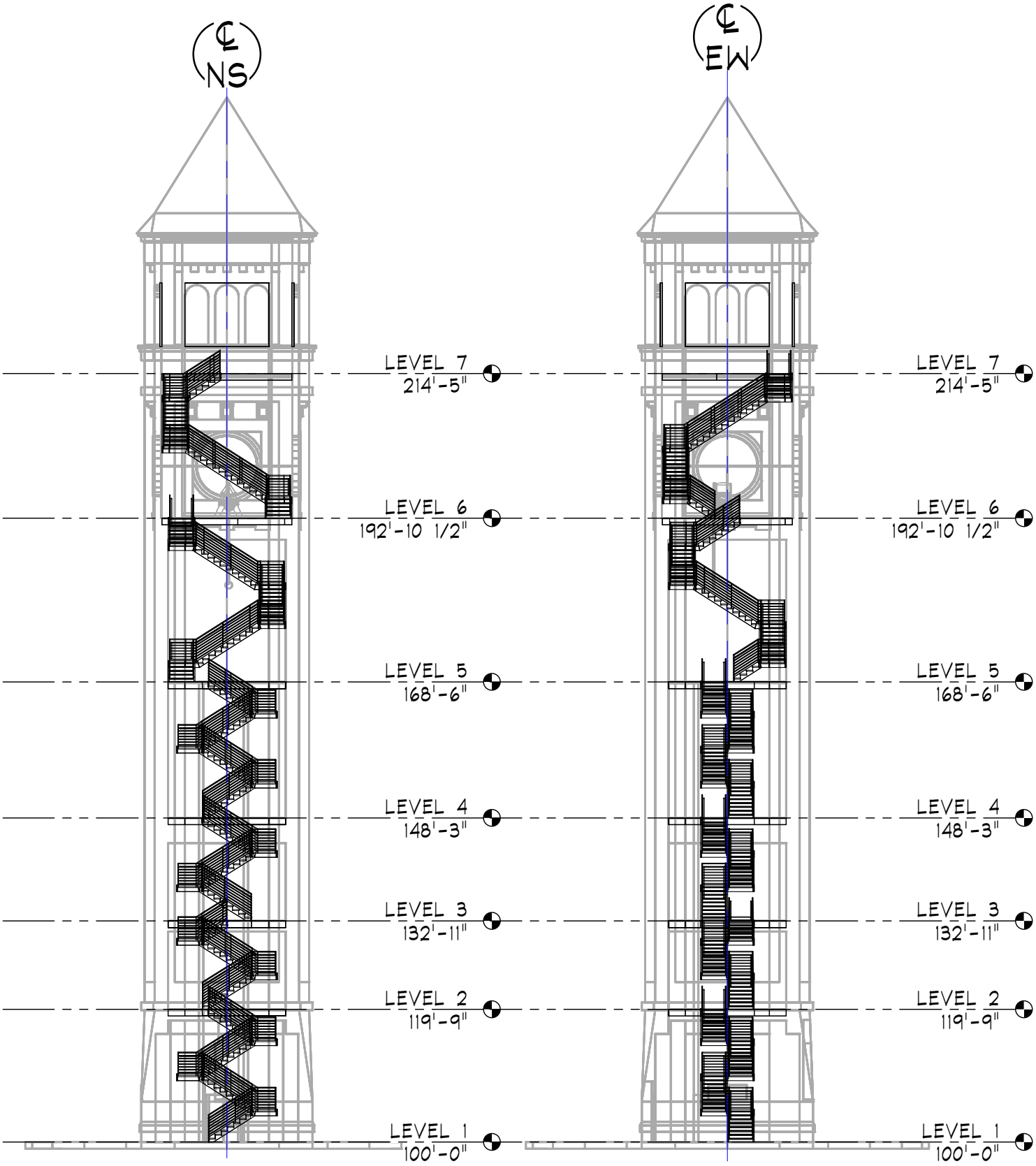
Photo of the Clock Drive Shaft Connection to the Clock Face

Photo of the Clockwork Mechanism that Shows Connections to the Pendulum Below, the (4) Clock Face Drive Shafts at Top, and the Counterweight Cable Running up to the Mid-Right

Photo of the Electronic Speaker System and the Lighting on the Observation Level

SECTION 4
APPENDIX 4.2 PLANS

OPTION 1 PLANS



NORTH ELEVATION

SCALE: 1" = 20'-0"

WEST ELEVATION

SCALE: 1" = 20'-0"

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

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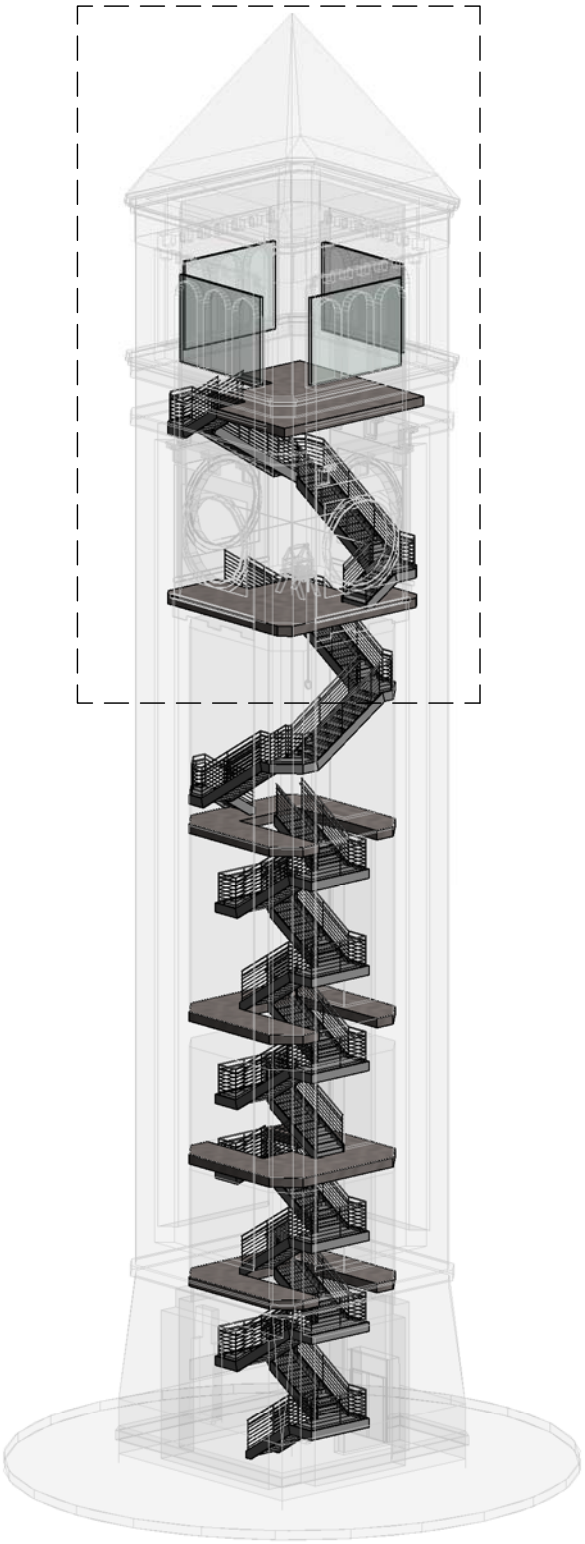
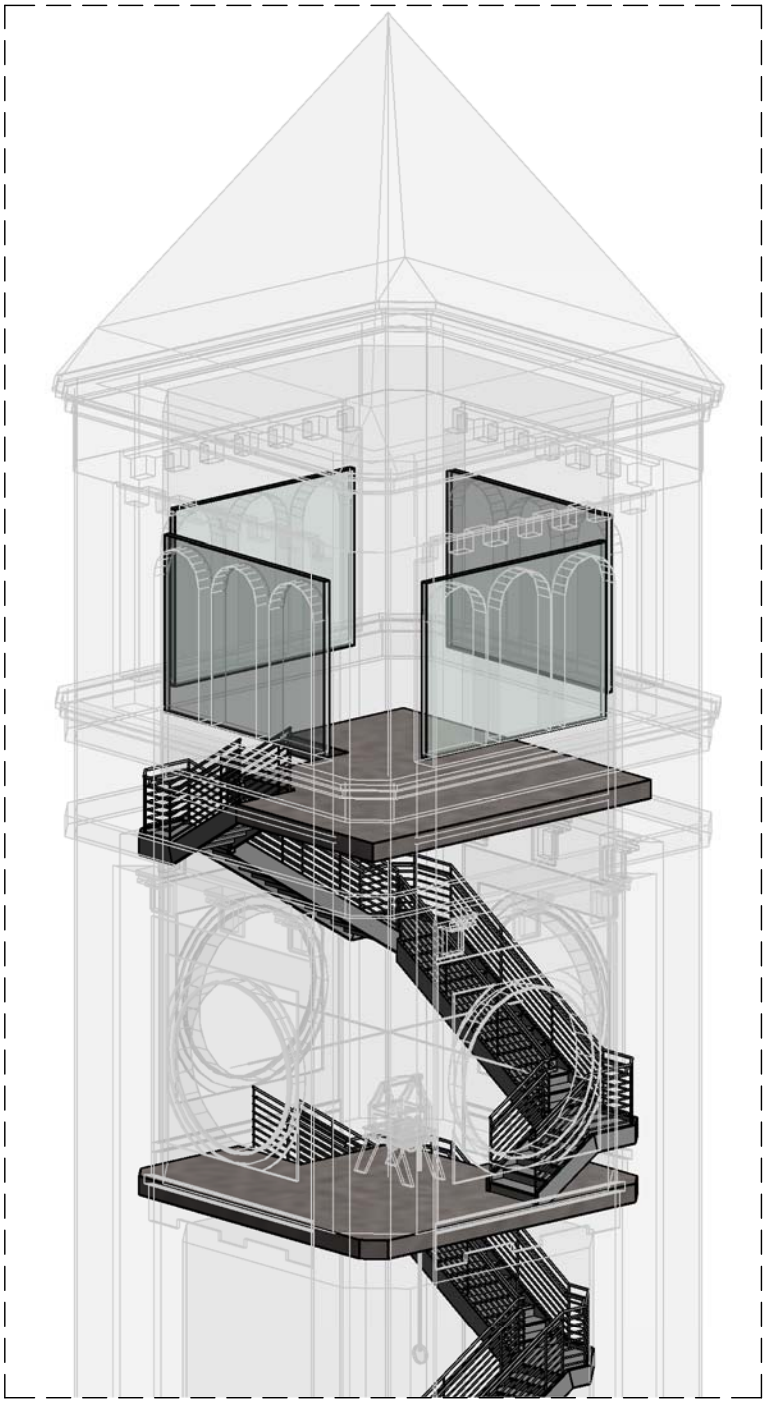
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	





ISOMETRIC VIEW

SCALE:

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

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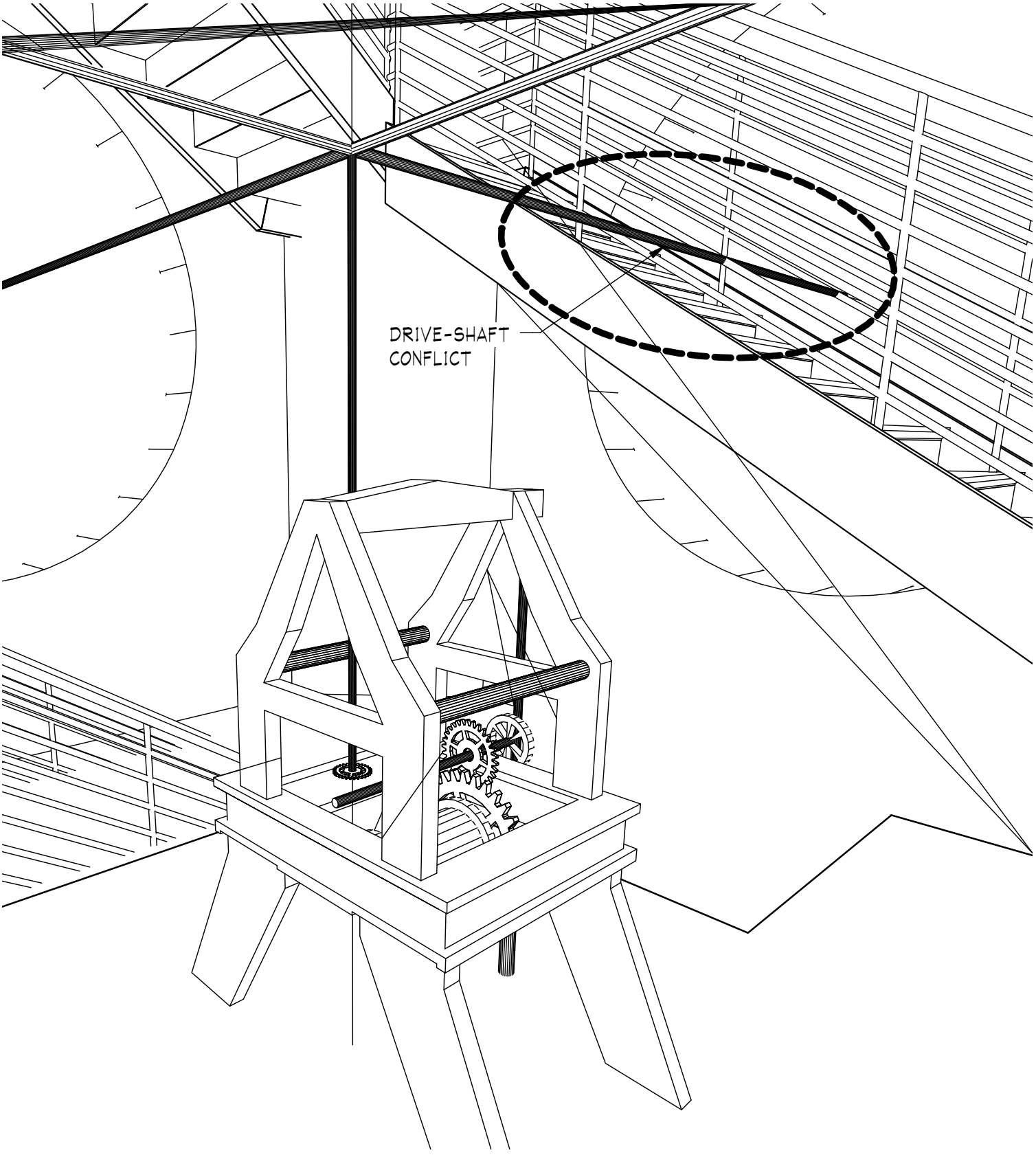
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



DRIVE-SHAFT CONFLICT

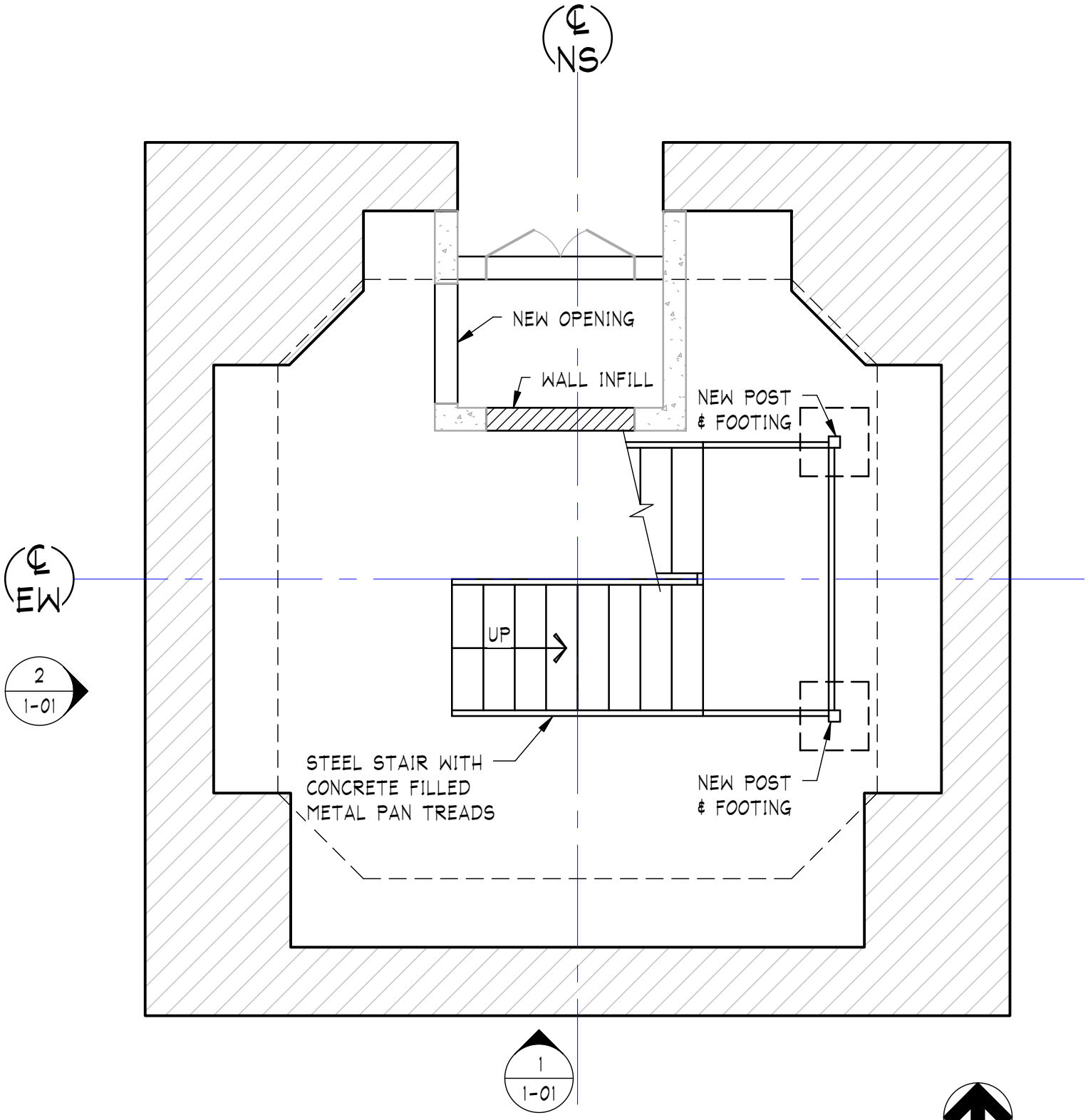
SCALE:

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-03**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 1

SCALE: 1/4" = 1'-0"

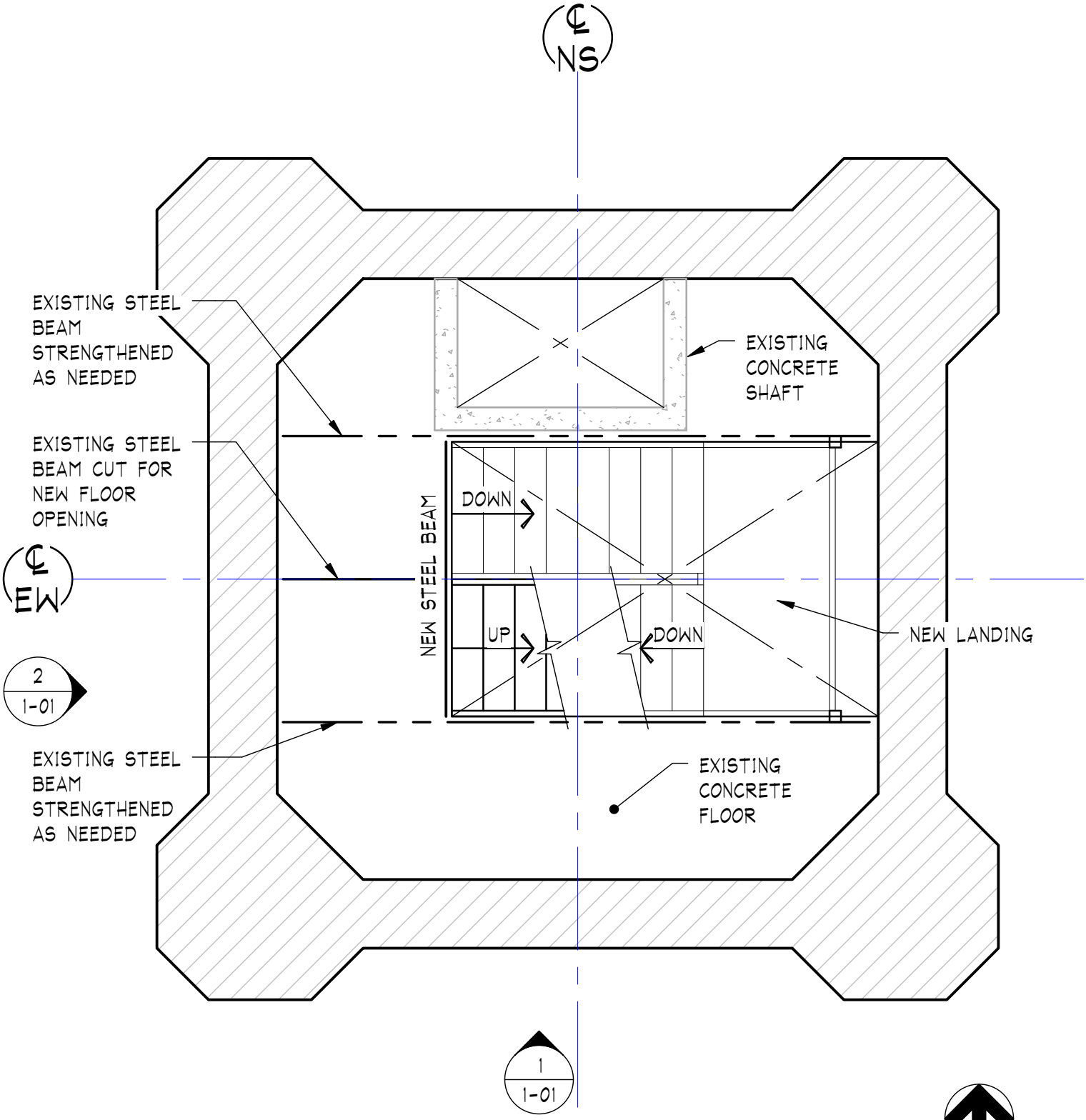
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-04**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 2

SCALE: 1/4" = 1'-0"

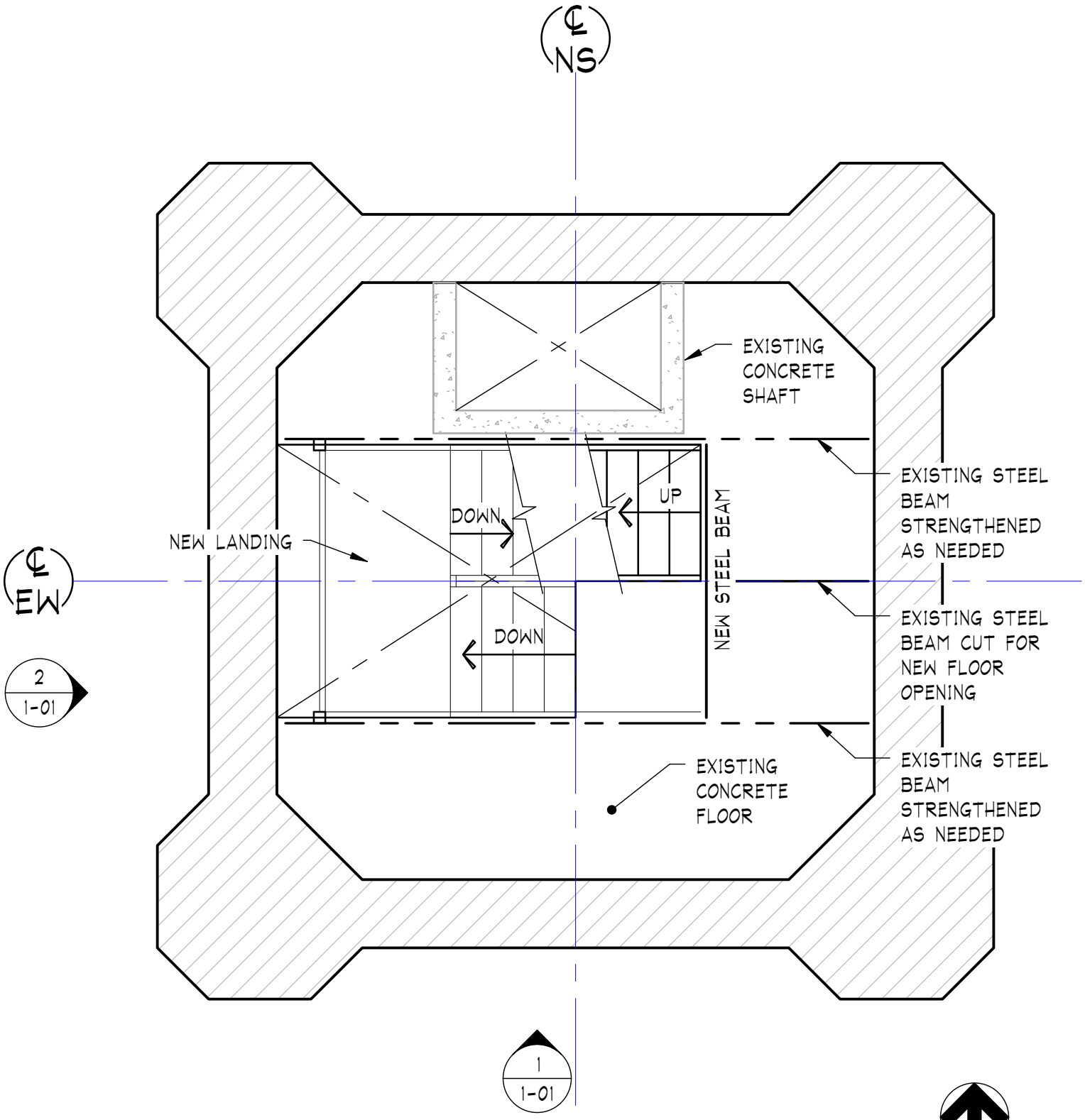
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-05**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 3

SCALE: 1/4" = 1'-0"

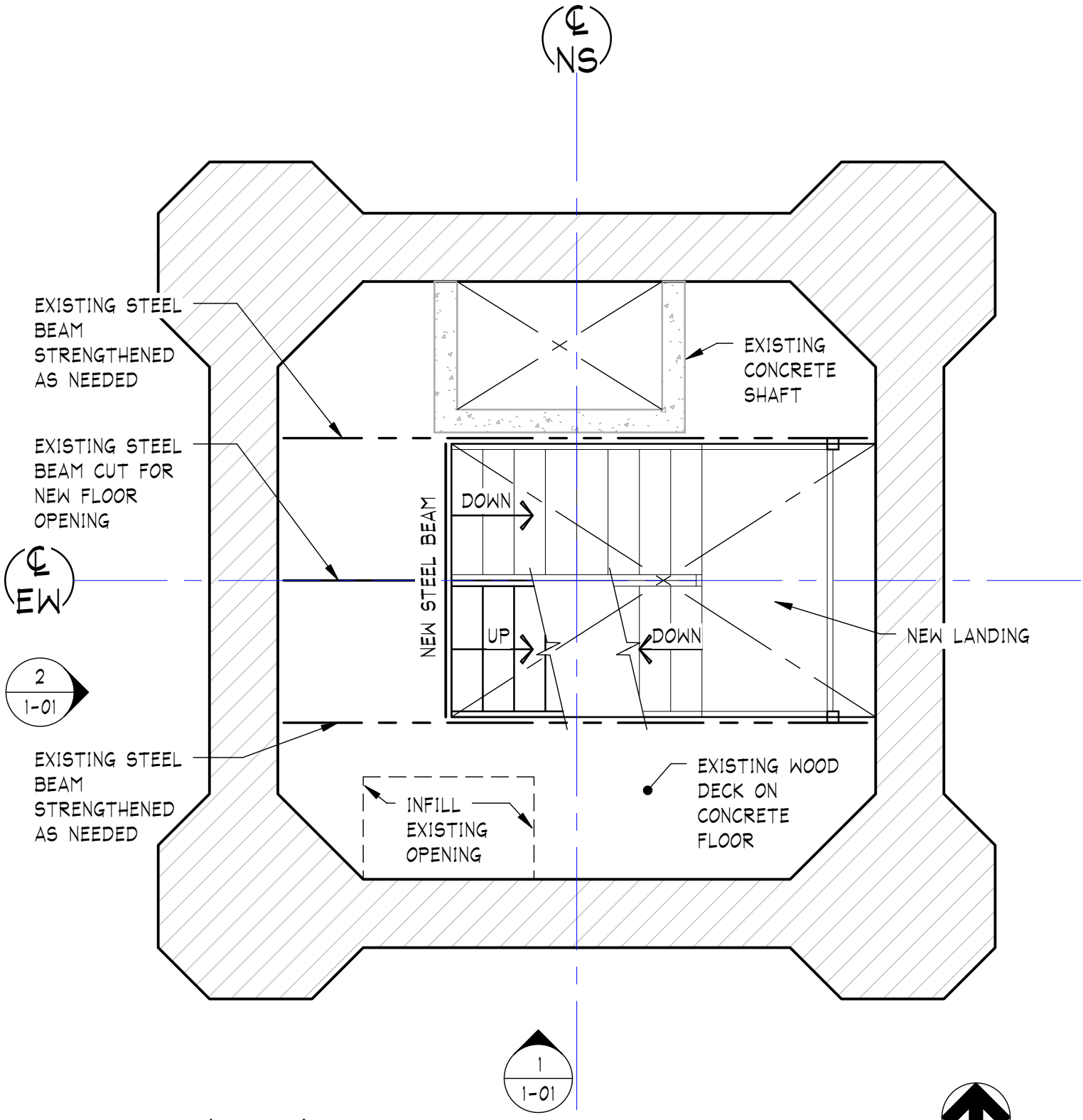
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-06**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 4

SCALE: 1/4" = 1'-0"

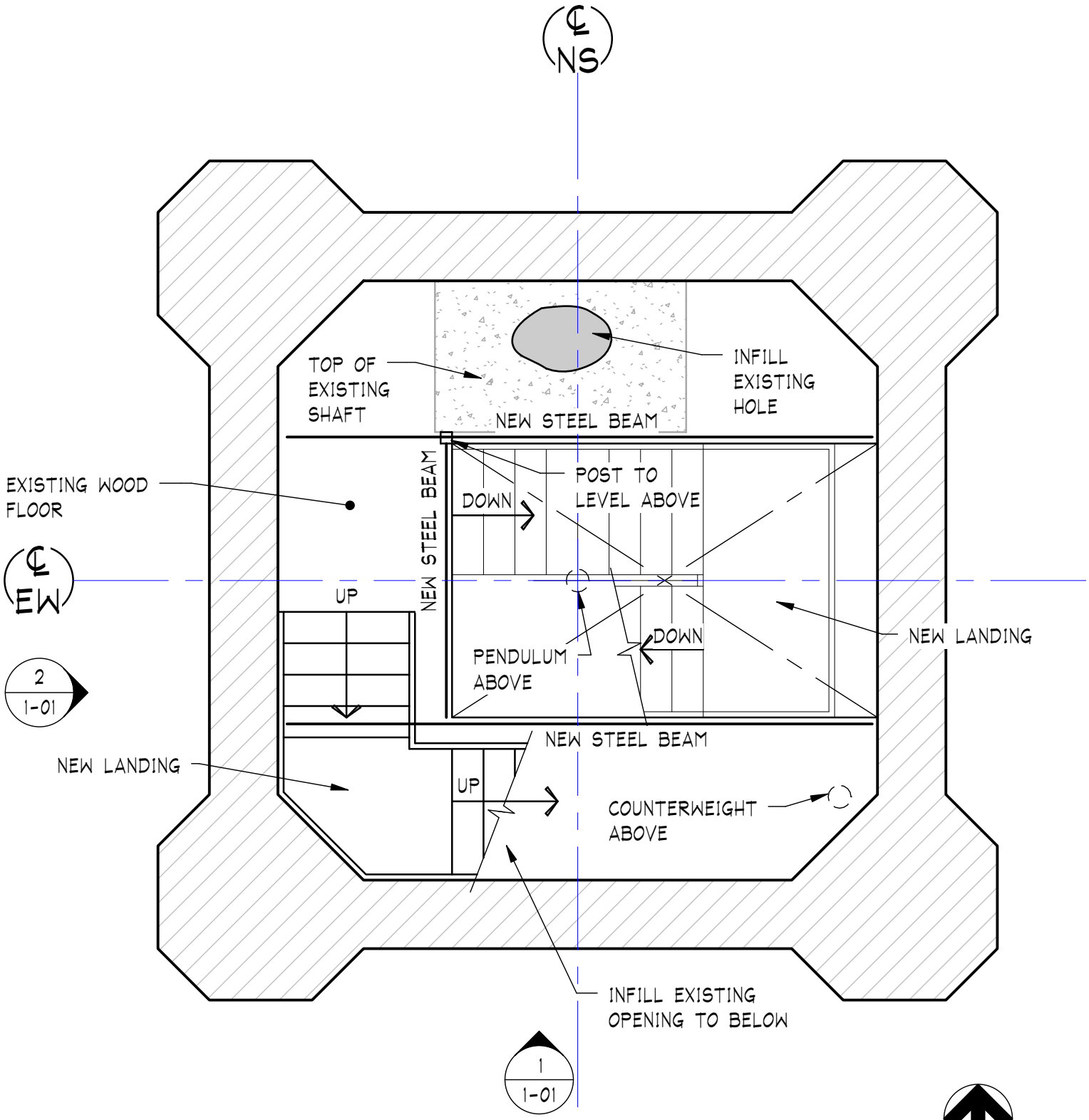
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-07**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 5

SCALE: 1/4" = 1'-0"

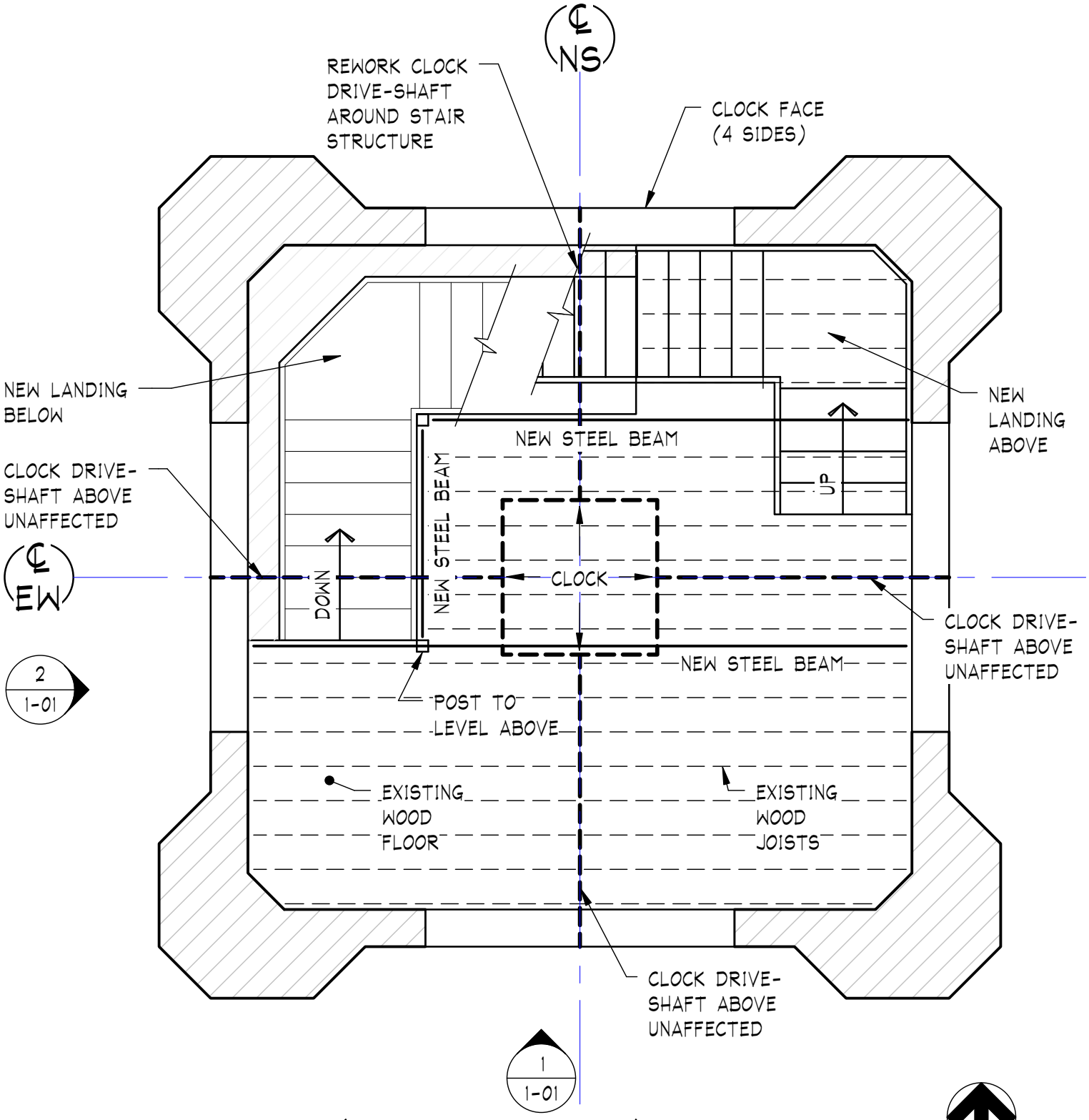
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-08**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 6 (CLOCKWORKS)

SCALE: 1/4" = 1'-0"

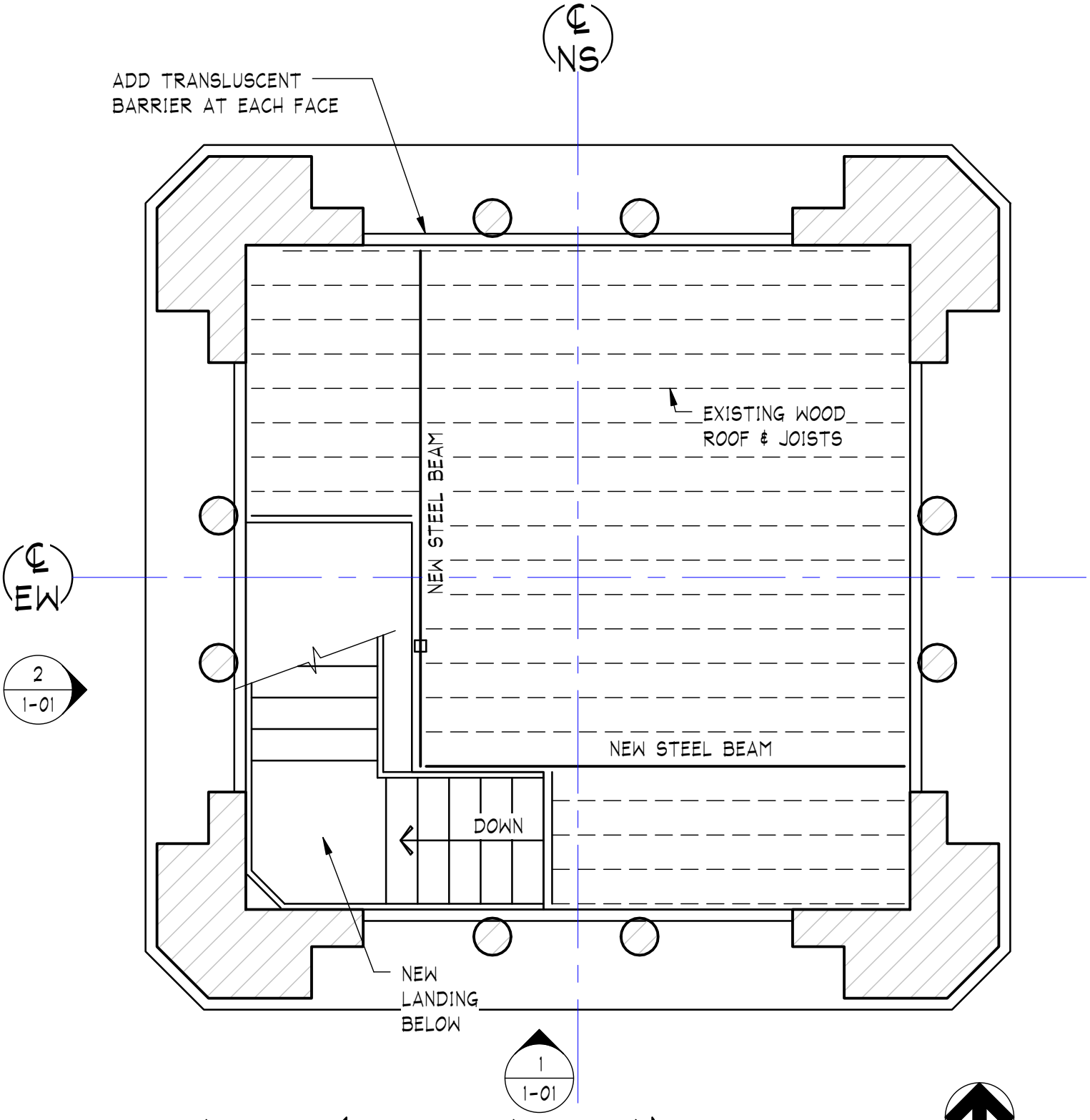
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

DWG. #:	**1-09**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 7 (OBSERVATION)

SCALE: 1/4" = 1'-0"

PROJECT NORTH

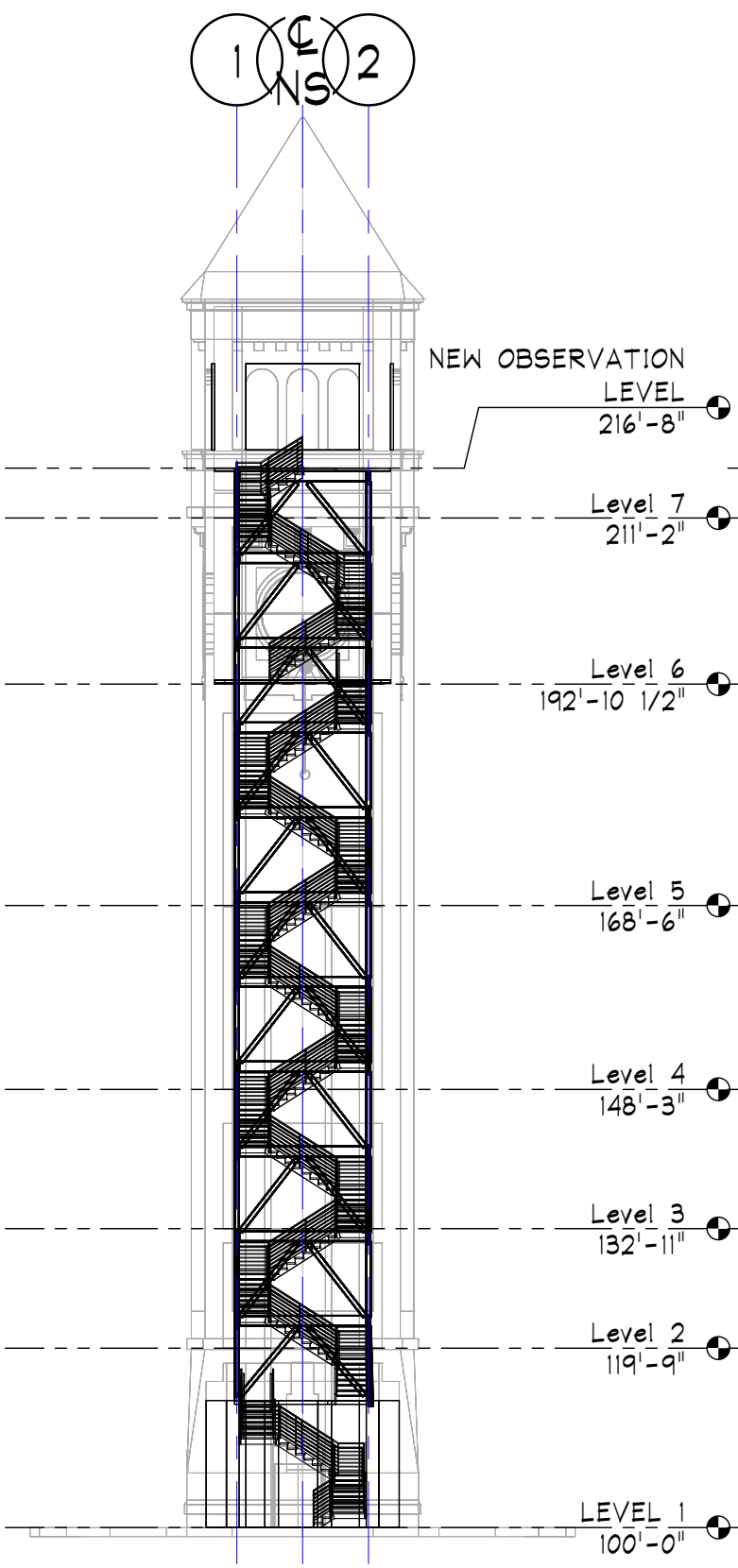
REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 1

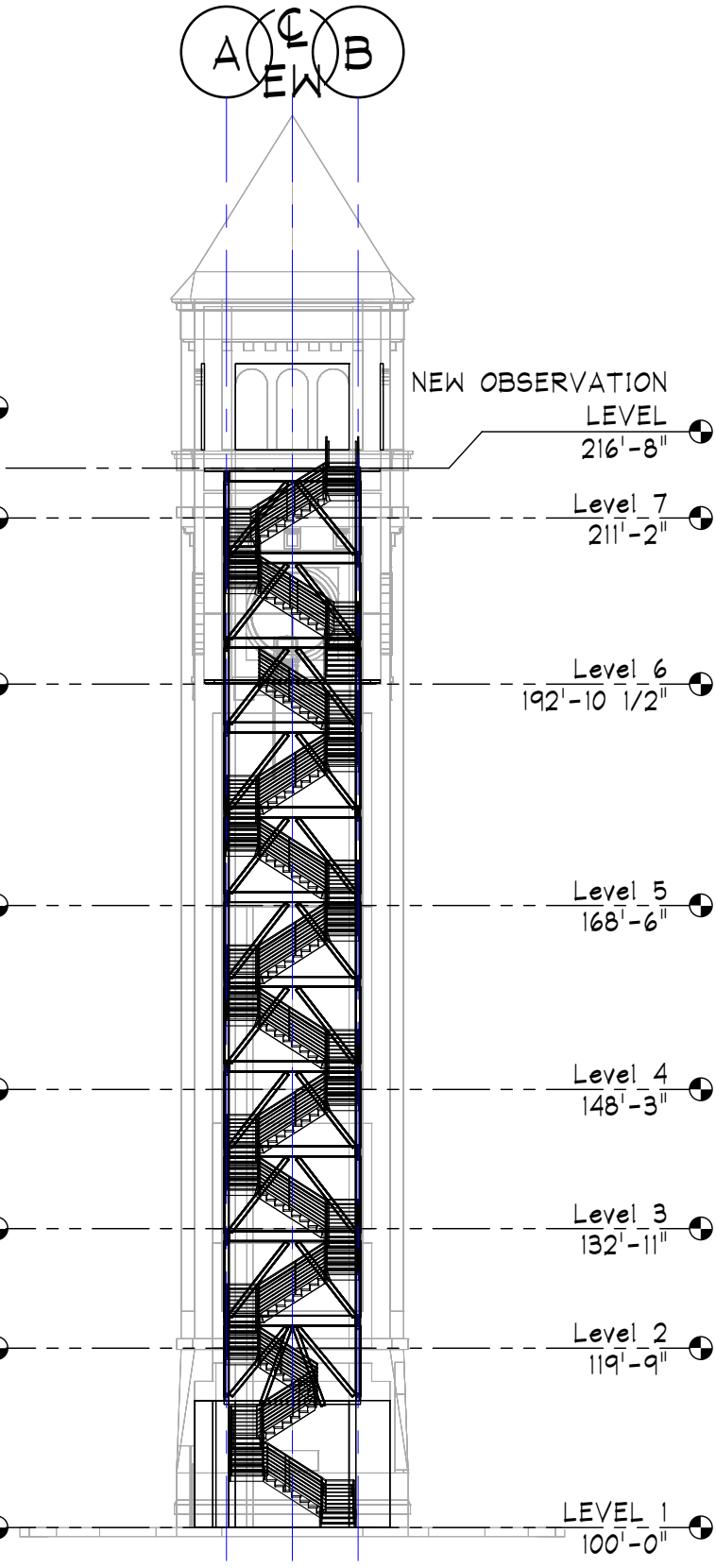
DWG. #:	**1-10**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	

OPTION 2 PLANS



NORTH ELEVATION

SCALE: 1" = 20'-0"



WEST ELEVATION

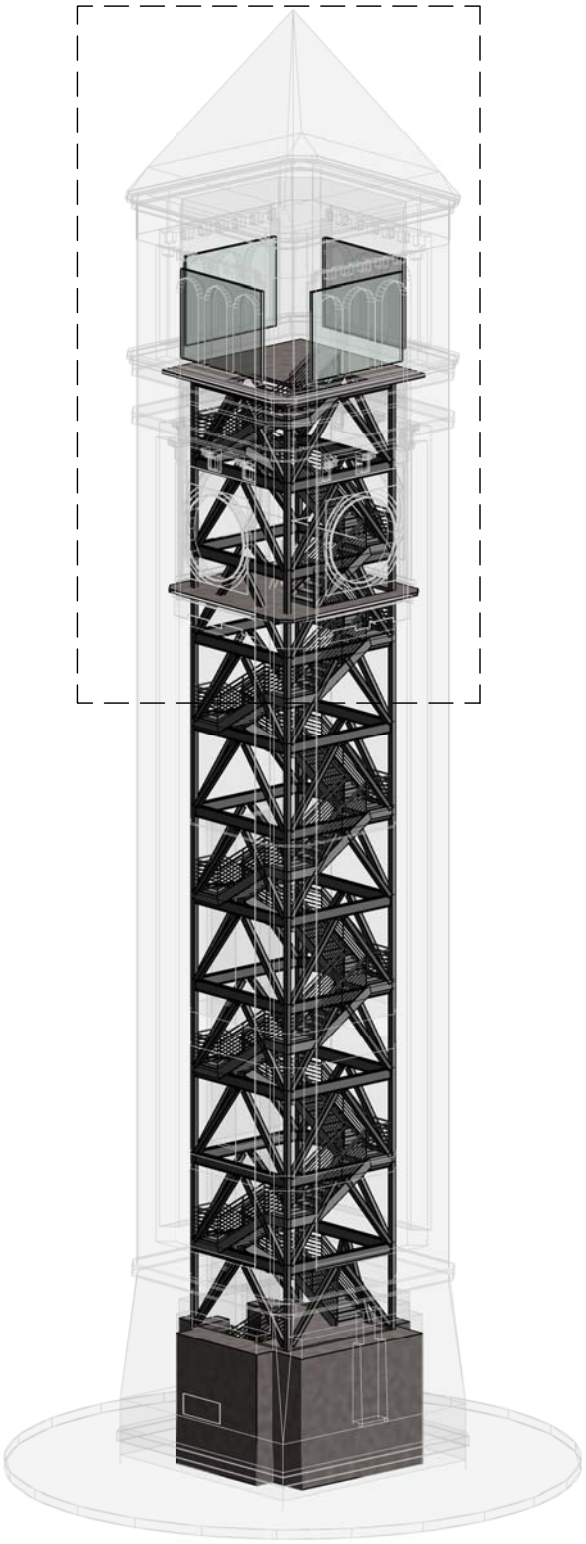
SCALE: 1" = 20'-0"

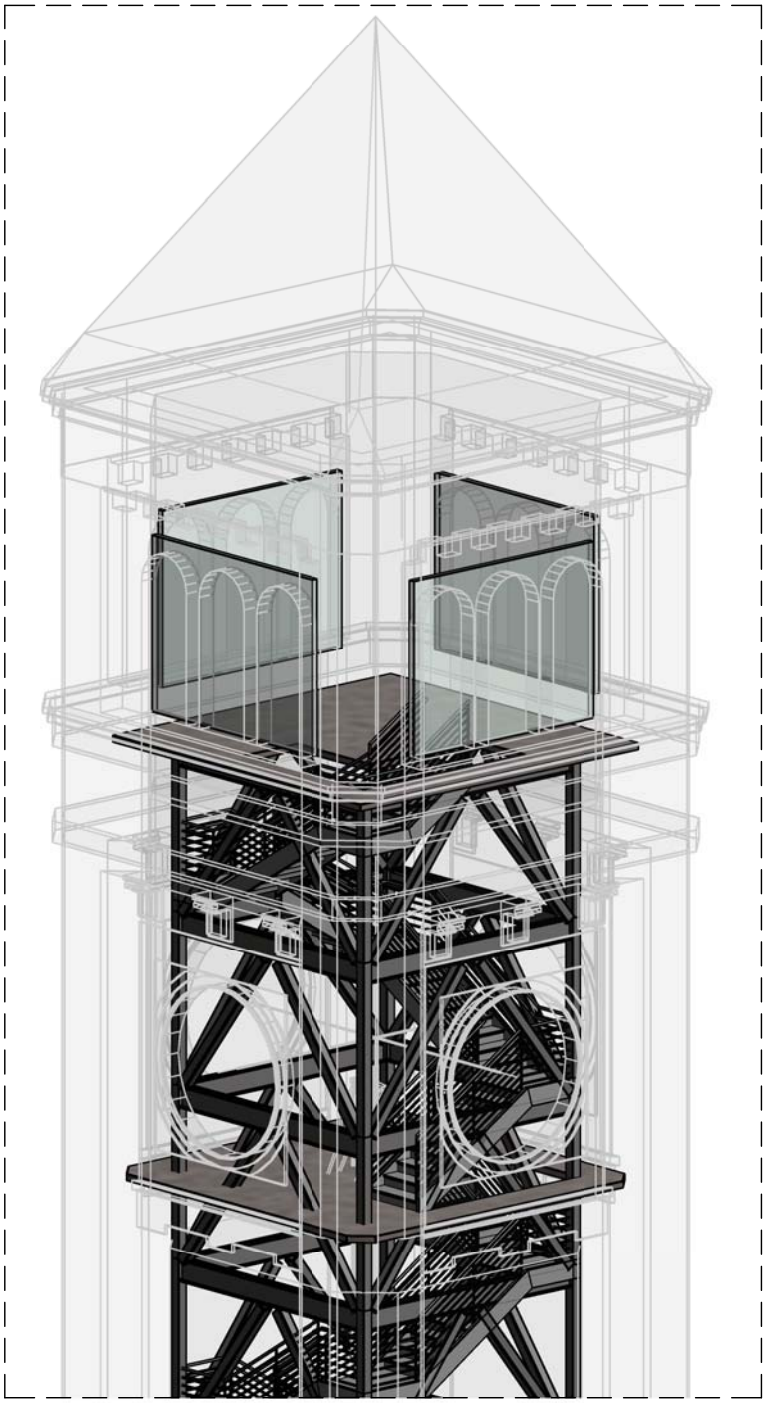
REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 2

DWG. #:	**2-01**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	





ISOMETRIC VIEW

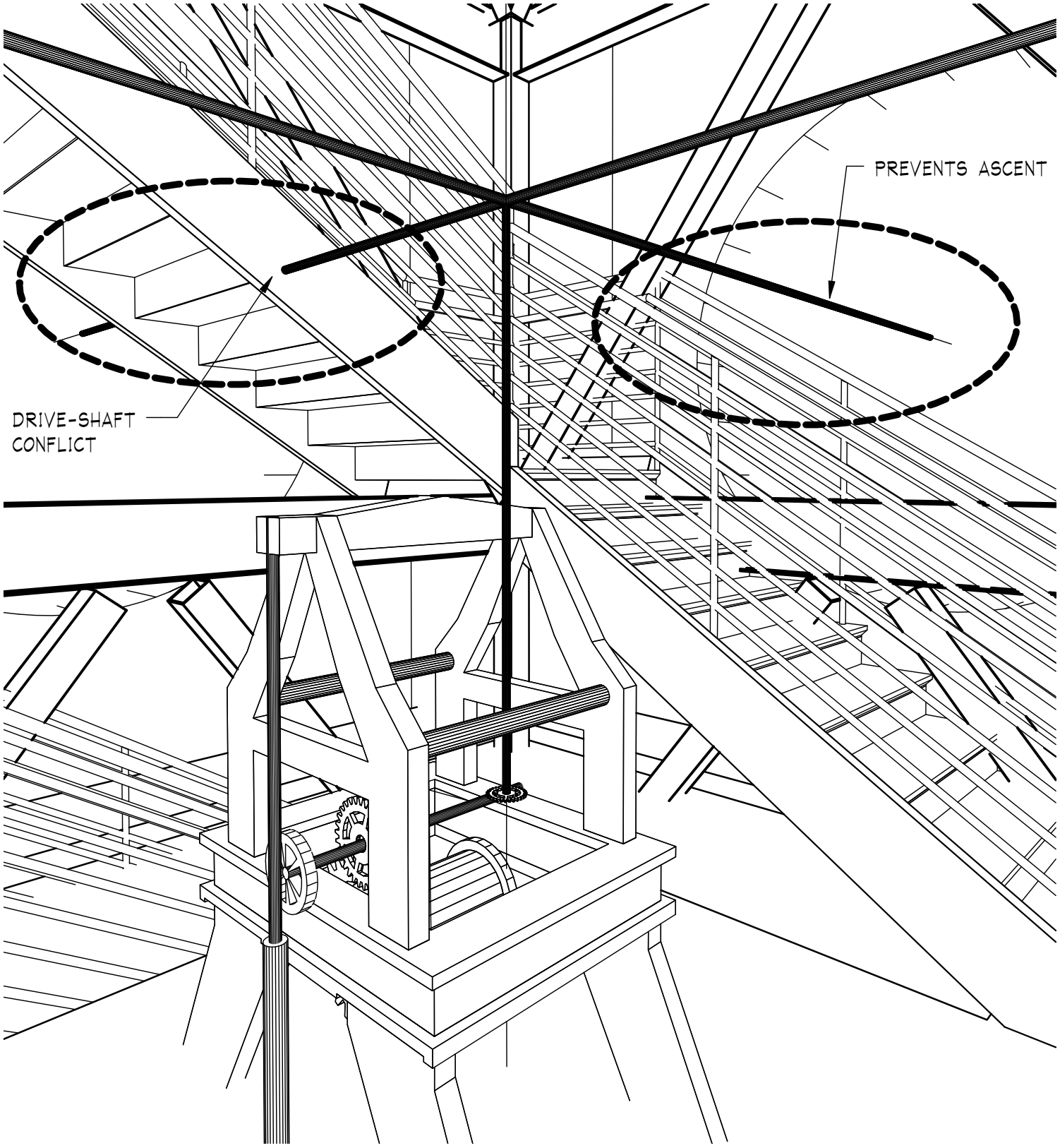
SCALE:

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 2

DWG. #:	**2-02**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



DRIVE-SHAFT CONFLICTS

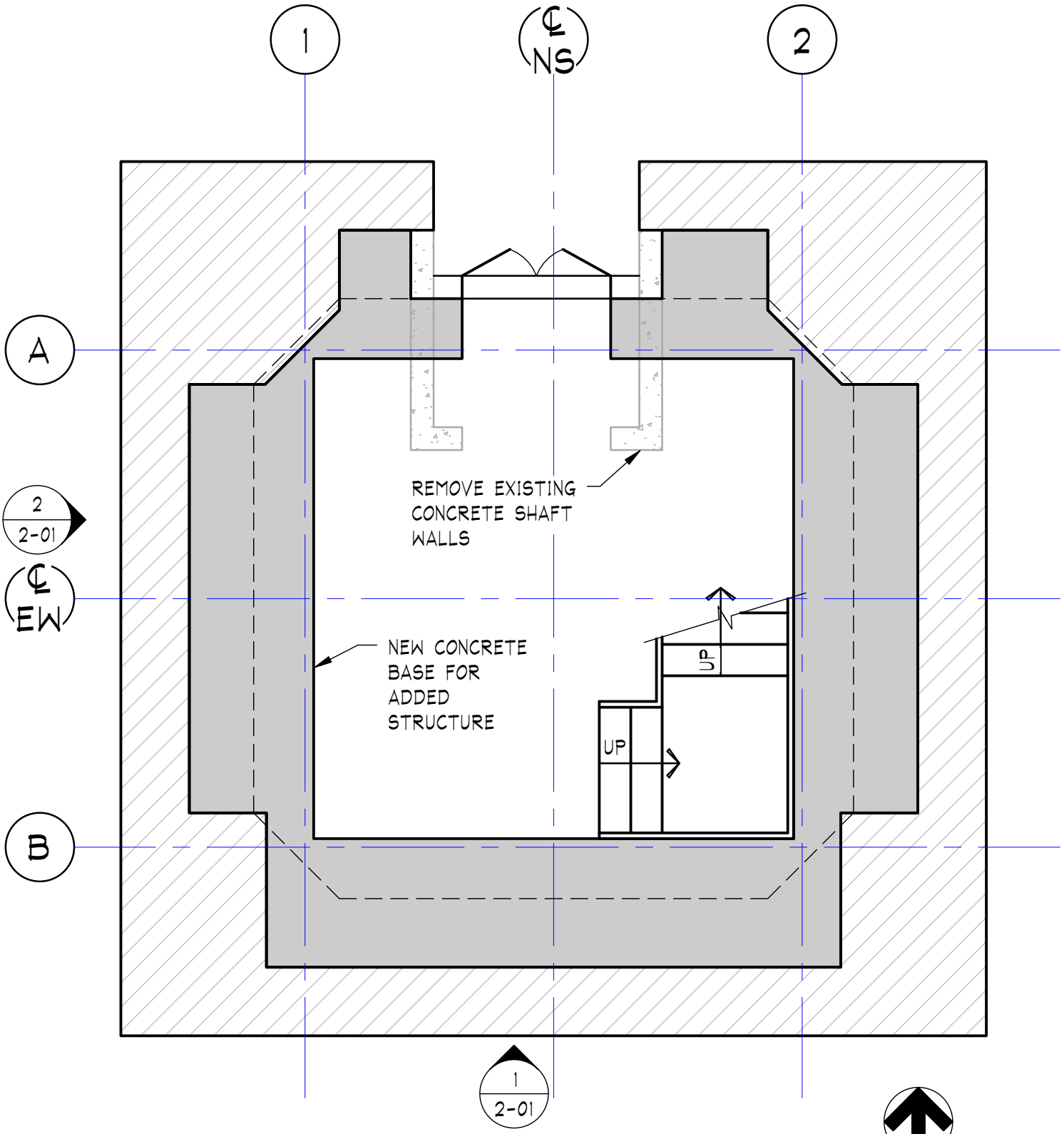
SCALE:

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 2

DWG. #:	**2-03**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



LEVEL 1

SCALE: 1/4" = 1'-0"

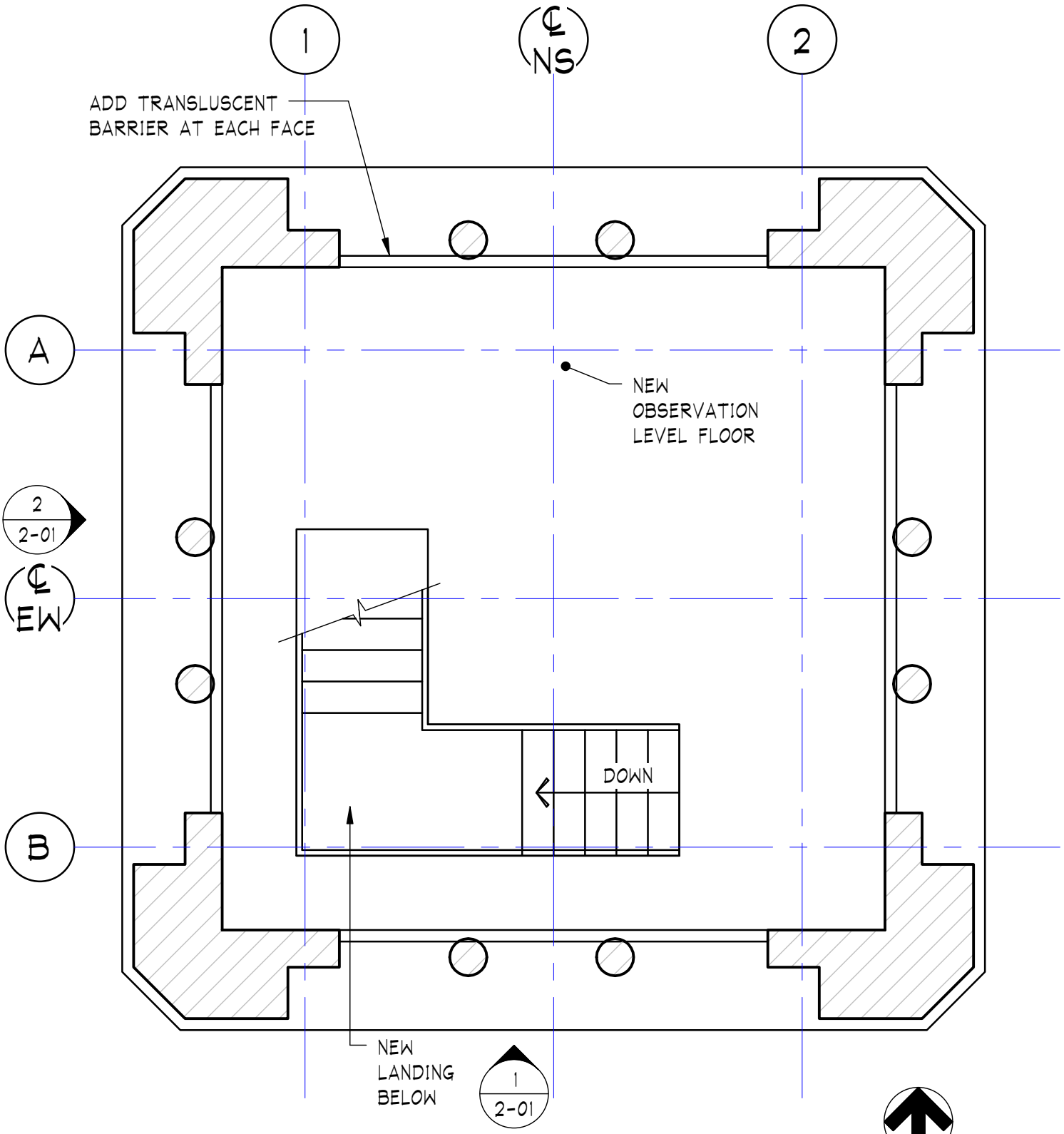
PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 2

DWG. #:	**2-04**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	



NEW OBSERVATION LEVEL

SCALE: 1/4" = 1'-0"

PROJECT NORTH

REF. SHEET

integrus ARCHITECTURE

CLOCK TOWER FEASIBILITY STUDY
OPTION 2

DWG. #:	**2-05**
JOB #:	21346.00
DRAWN BY:	CC
DATE:	2-14-2014
REF. DOC.:	