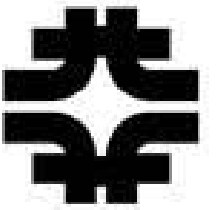




## Alternative Evaluations

- Sites Evaluation Location Key
- Sites Evaluation Matrix
- Pre-Conceptual Building Massing Studies
- Functional Review Committee Charge and Comments
- Director's Presentation Images

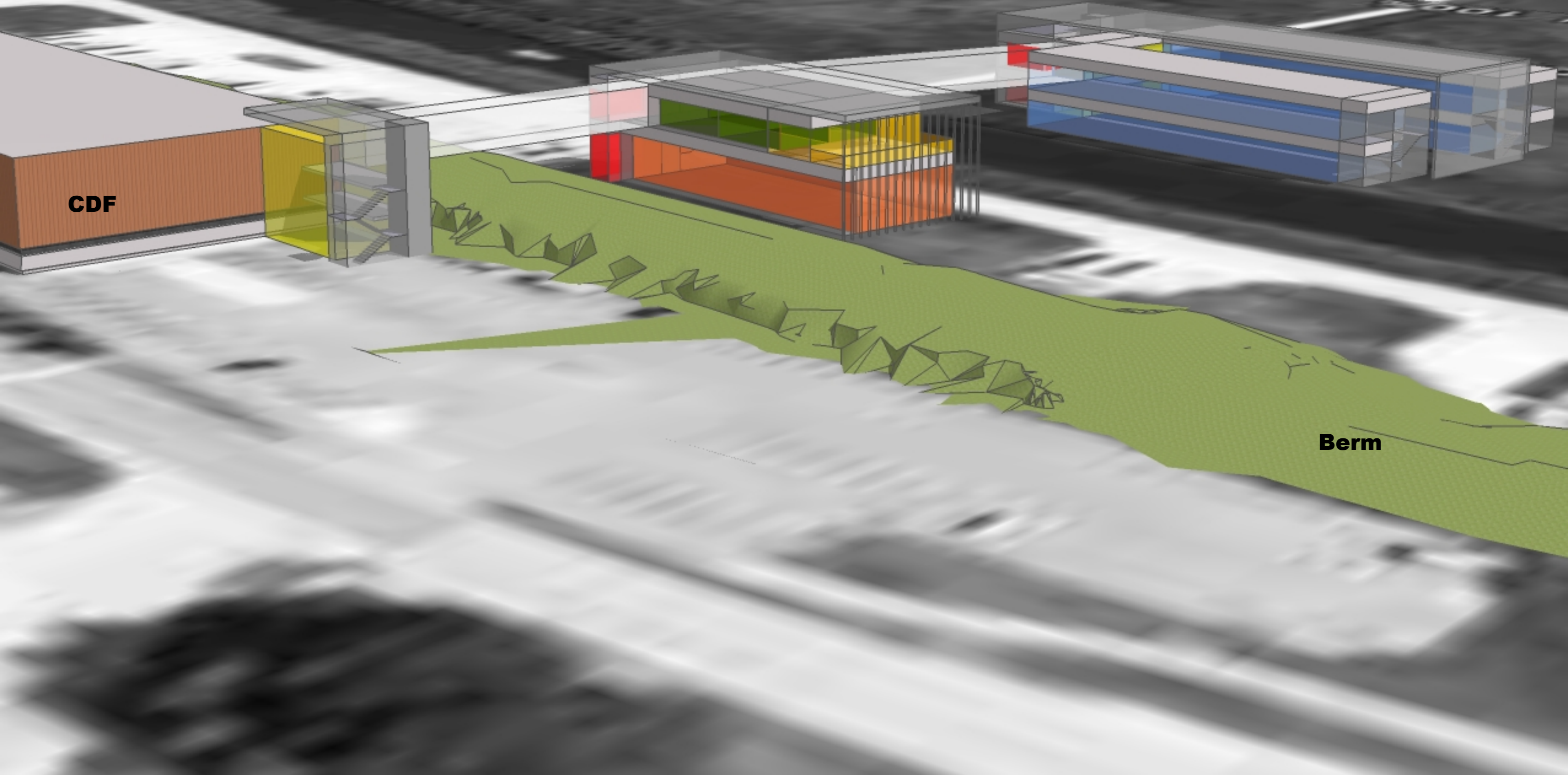
# IARC Sites Examined

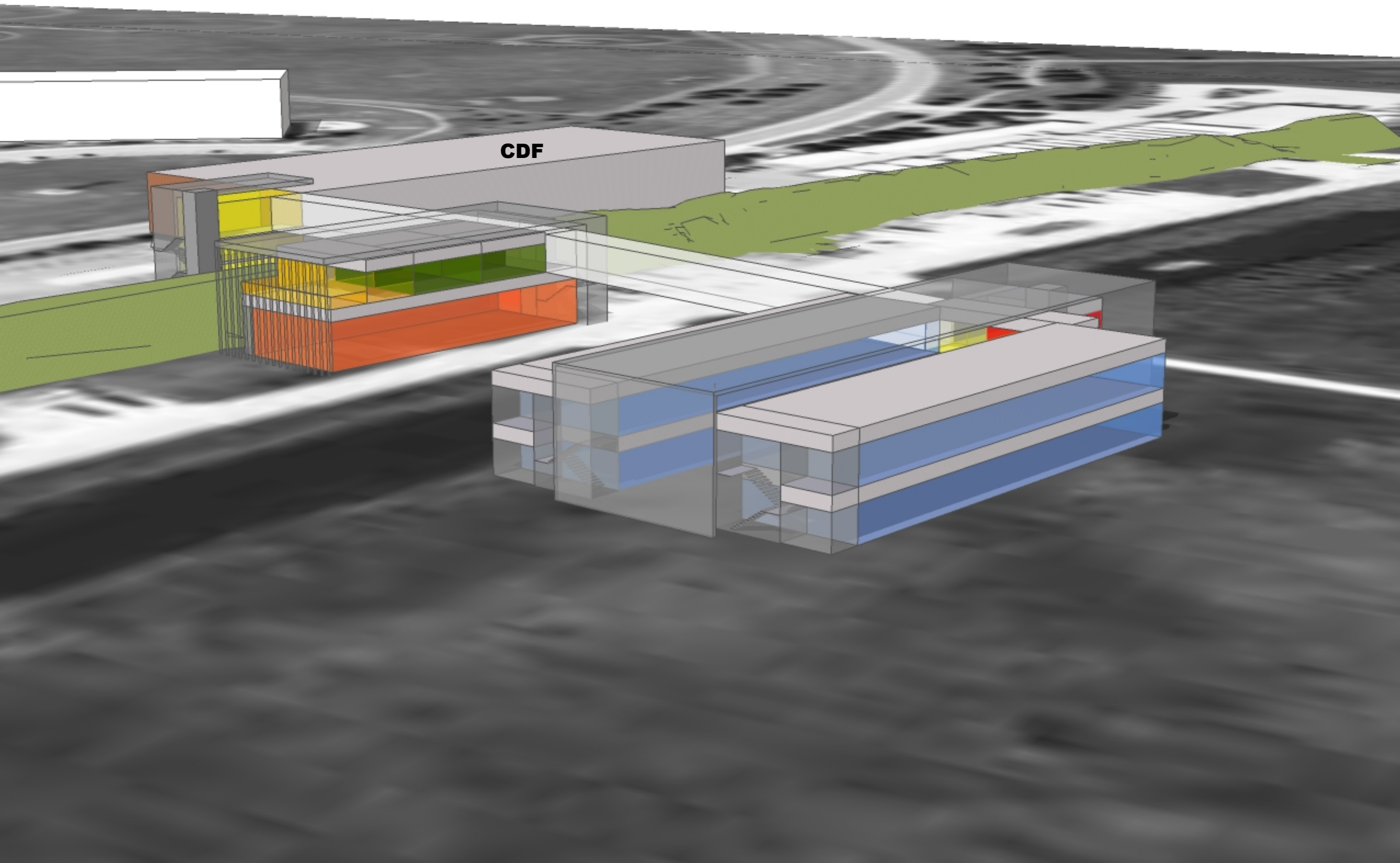


| Potential Sites                     |            |  |            |   |           |  |            |   |           |   |           |   |            |   |            |  |
|-------------------------------------|------------|--|------------|---|-----------|--|------------|---|-----------|---|-----------|---|------------|---|------------|--|
| Evaluation Criteria                 | 1          |  | 2          |   | 3         |  | 4          |   | 5         |   | 6         |   | 7          |   | 8          |  |
| Environment                         | Score      |  | Score      |   | Score     |  | Score      |   | Score     |   | Score     |   | Score      |   | Score      |  |
| Wooded                              | 10         | No issues  | 10         | No issues   | 2         | Heavily wooded - extensive tree removal  | 2          | No issues   | 2         | Wooded - tree removal, some is deadwood clearance   | 0         | Heavily wooded - extensive tree removal of older growth trees           | 3          | Wooded - tree removal   | 10         | Clear site   |
| Wetlands                            | 10         | No issues  | 10         | No issues   | 0         | Wetland site- wetland replacement required   | 8          | No wetlands   | 2         | Some wetland issues   | 8         | Minimal issues  | 8          | Minimal issues  | 9          | Minimal issues   |
| <b>Utilities</b>                    |            |  |            |   |           |  |            |   |           |   |           |   |            |   |            |  |
| Power                               | 8          | Available  | 8          | Available   | 9         | Readily available  | 9          | Readily available   | 8         | Available   | 8         | Available   | 8          | Available   | 9          | Available  |
| ICW                                 | 8          | Available  | 8          | Available   | 9         | Readily available  | 9          | Readily available   | 8         | Available   | 8         | Available   | 8          | Available   | 9          | Available  |
| Domestic Water                      | 8          | Available  | 8          | Available   | 9         | Readily available  | 9          | Readily available   | 8         | Available   | 8         | Available   | 8          | Available   | 9          | Available  |
| Sanitary                            | 8          | Available  | 8          | Available   | 9         | Readily available  | 9          | Readily available   | 8         | Available   | 8         | Available   | 8          | Available   | 9          | Available  |
| Communications                      | 8          | Available  | 8          | Available   | 9         | Readily available  | 9          | Readily available   | 8         | Available   | 8         | Available   | 8          | Available   | 9          | Available  |
| <b>Access - Vehicular - Parking</b> |            |  |            |   |           |  |            |   |           |   |           |   |            |   |            |  |
| Vehicular Access                    | 10         | Easily accessed by existing roads  | 10         | Easily accessed by existing roads   | 5         | Accessed via NuMI back roads.  | 10         | Easily Accessed via existing roads  | 8         | Access via Kautz road with tree clearing  | 5         | Good access after tree clearing   | 10         | Good Access   | 10         | Good Access  |
| Parking                             | 5          | Need to replace and add parking occupied by building and truck circulation footprint | 10         | Need new lot or share LSEC lot from across the street. Sharing would create pedestrian crossing issue | 3         | Previously planned road extension from Mini Boone to LSEC could be constructed. Will need parking lot. Possibly expand Minos parking | 8          | Could share LSEC lot via pedestrian walk from building- no traffic interference. Also could share Wilson Hall lot across the street | 7         | Could share LSEC lot via pedestrian walk from building- no traffic interference. Also could share Wilson Hall lot across the street | 0         | Need to create separate lot with tree clearing required                 | 2          | Need to create separate lot with tree clearing required                   | 8          | Need additional paved area but could be an appendage to existing industrial area lots          |
| Truck Access                        | 8          | Good   | 8          | Good  | 8         | Good   | 9          | Good Access   | 1         | Requires tree clearance and construction of new road and turn around  | 3         | Accessible from roads, extensive tree clearance to provide truck access | 10         | Good Access   | 9          | Good Access  |
| <b>Impact - Visibility</b>          |            |  |            |   |           |  |            |   |           |   |           |   |            |   |            |  |
| Prominence                          | 10         | Somewhat Prominent   | 10         | Very Prominent  | 8         | Prominent  | 5          | Average   | 10        | Very prominent with view across pond from entrance road to Wilson Hall  | 8         | Would be noticed on way to Wilson Hall                                  | 10         | Would be prominent in its location along the Wilson Hall north/south axis | 0          | Minimal  |
| Effectiveness                       | 8          | Could be integral to central campus plan   | 0          | Prominence will distract from LSEC and sequence that was established                                  | 8         | Could be developed as an architectural transition between Minos and LSEC   | 5          | Can be integrated into a central campus plan - but not seen by average visitor  | 10        | Can be integrated in central campus plan and could be visual asset across pond  | 4         | May not create strong impression if set back from road                  | 8          | Should be an effective relationship                                       | 5          | Enhancement to technical campus  |
| <b>Intangibles - Editorial</b>      |            |  |            |   |           |  |            |   |           |   |           |   |            |   |            |  |
| <b>Site Development Costs</b>       |            |  |            |   |           |  |            |   |           |   |           |   |            |   |            |  |
| Relationship to main campus         | 5          | Medium   | 5          | Medium  | 2         | High   | 6          | Medium  | 3         | Medium +  | 2         | High  | 6          | Medium  | 8          | Medium -   |
| Deal Breakers ??                    | 3          | Related  | 3          | Somewhat distant  | 0         | Distant  | 6          | Integrated but in a secondary way   | 10        | Integral  | 4         | Somewhat distant in effect  | 5          | Somewhat distant  | 0          | None   |
|                                     | ??         |  | ??         | Too Prominent ?? Conflict with LSEC ??  |           | Woods and Wetlands, Distance from campus   |            | Not enough prominence? Requires elimination of Kidney Pond  |           | Site may be better suited to another future project (i.e. conference center, administration center, hotel??)                        |           | Older growth woods removal could veto site                              |            | None noted  |            | If it is determined that the building needs prominent location and proximity to central campus |
| <b>Totals</b>                       | <b>109</b> |  | <b>106</b> |   | <b>81</b> |  | <b>104</b> |   | <b>93</b> |   | <b>74</b> |   | <b>102</b> |   | <b>104</b> |  |



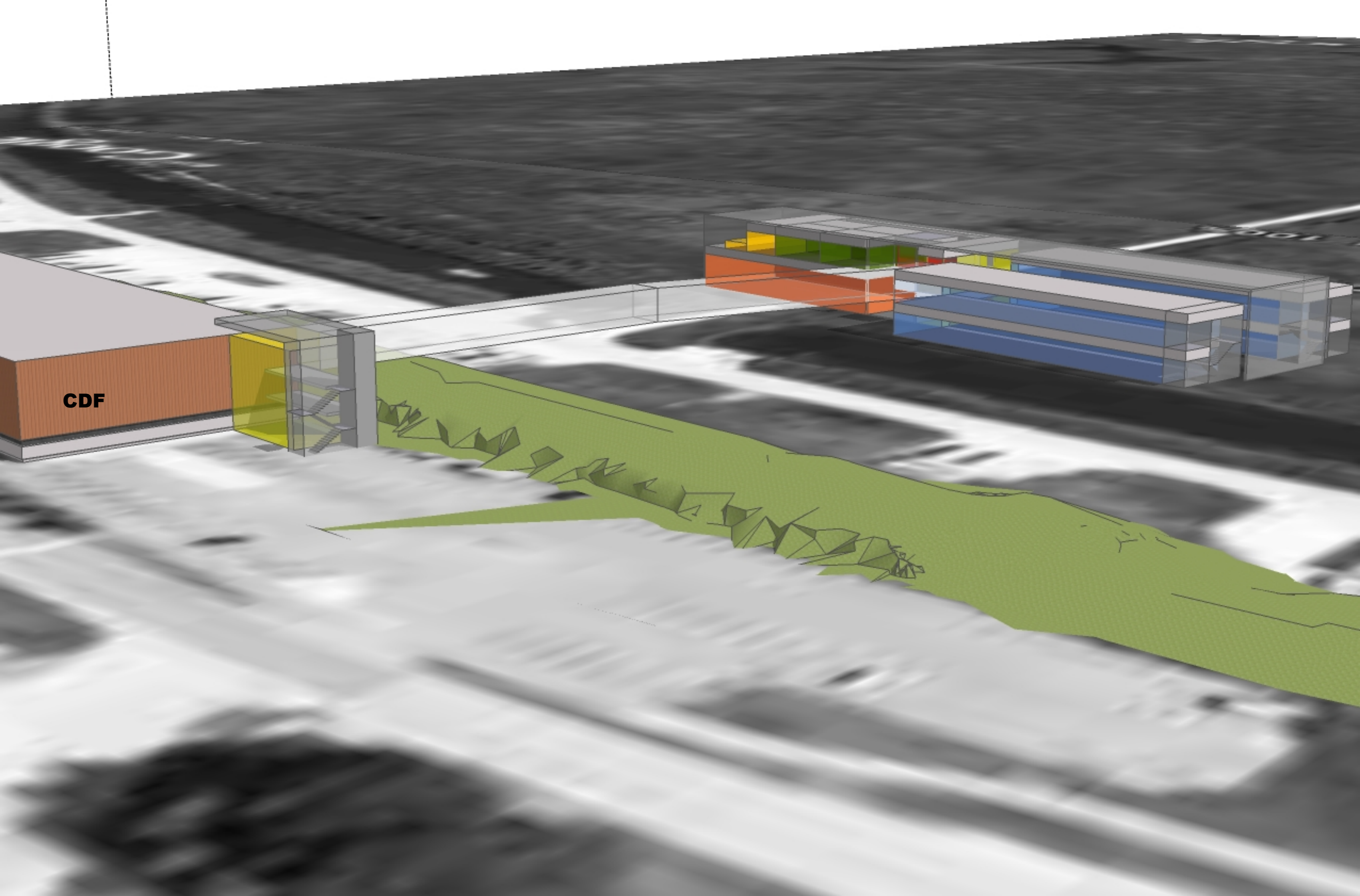
# Bridge Schemes



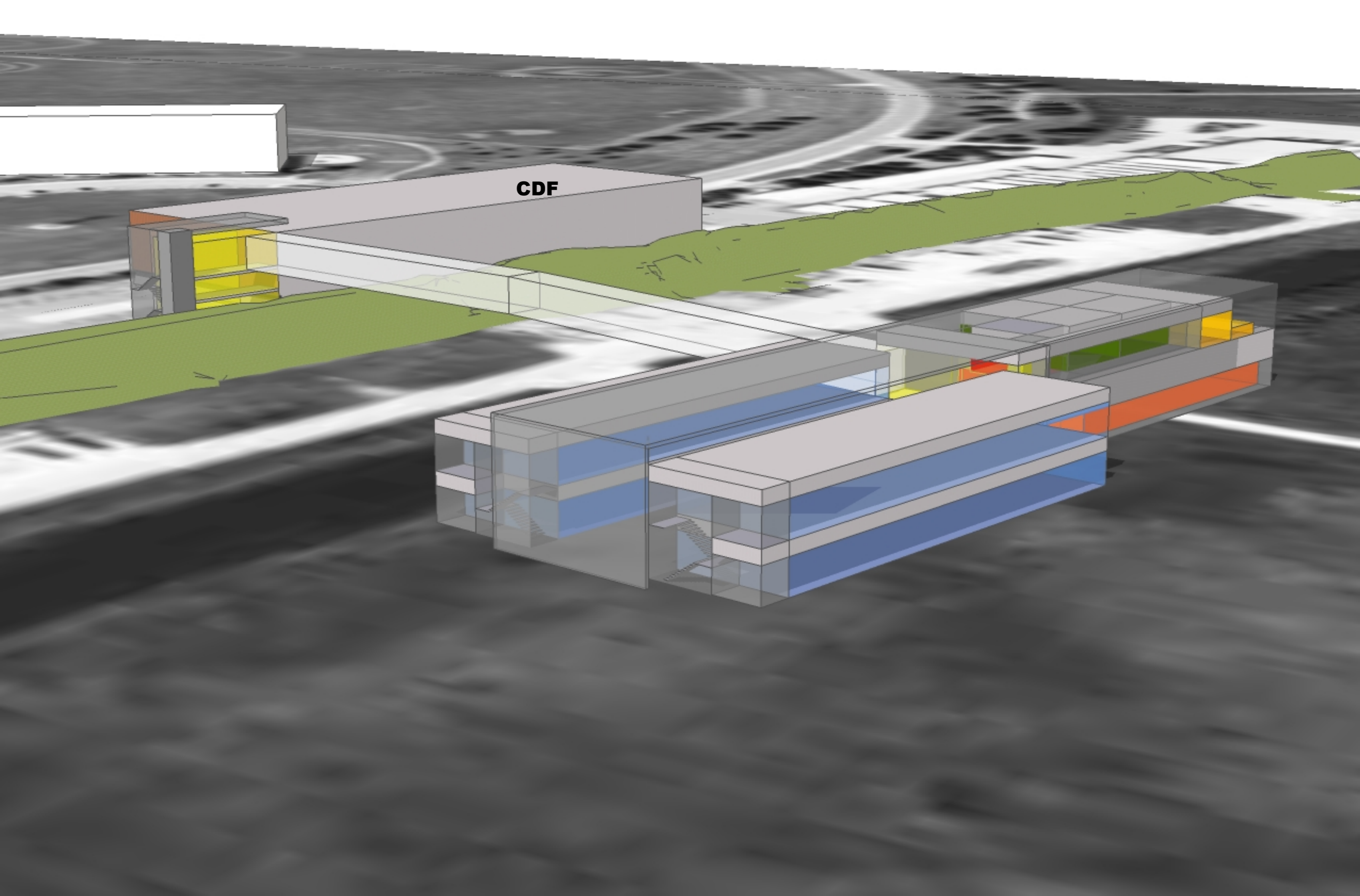


**CDF**





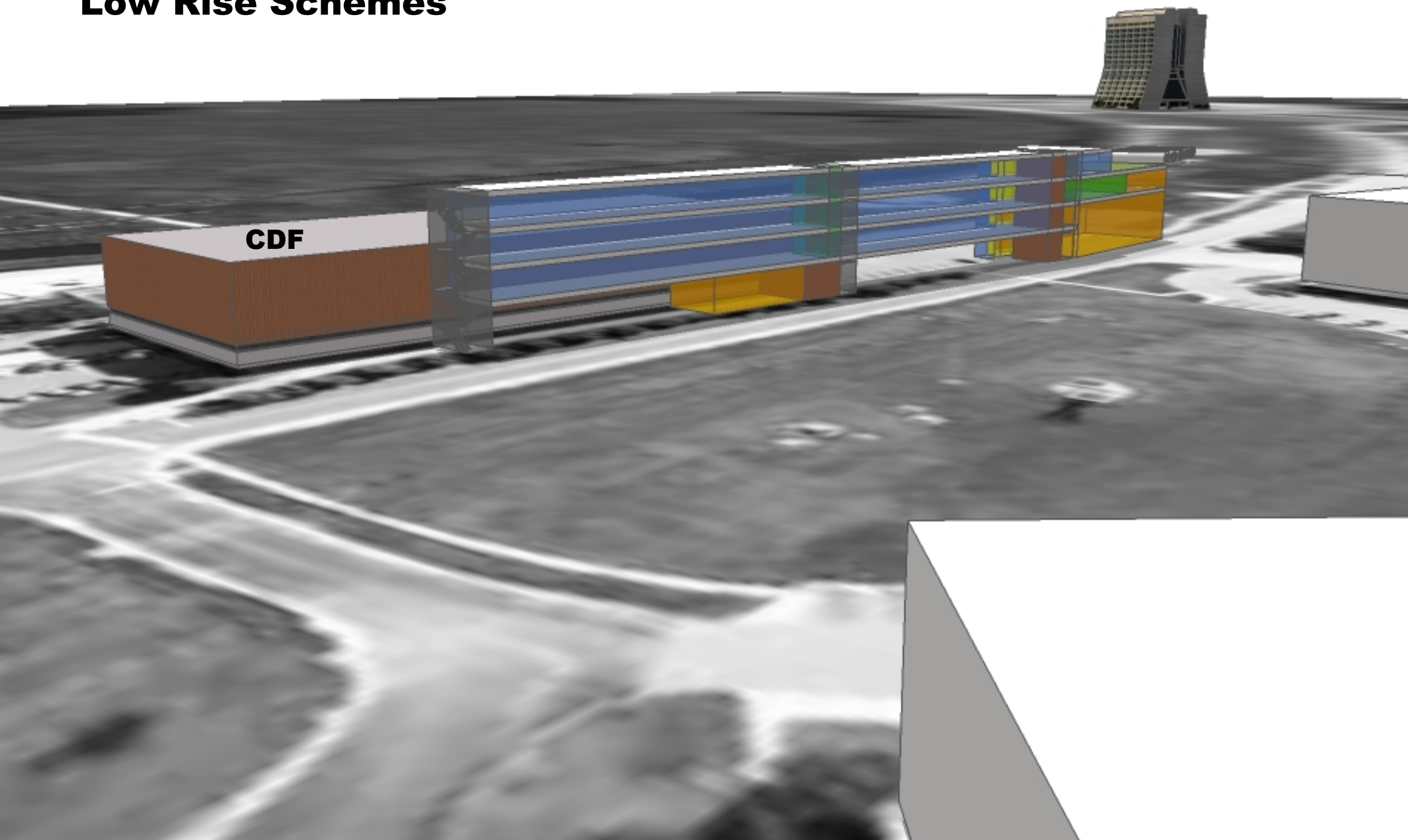
**CDF**



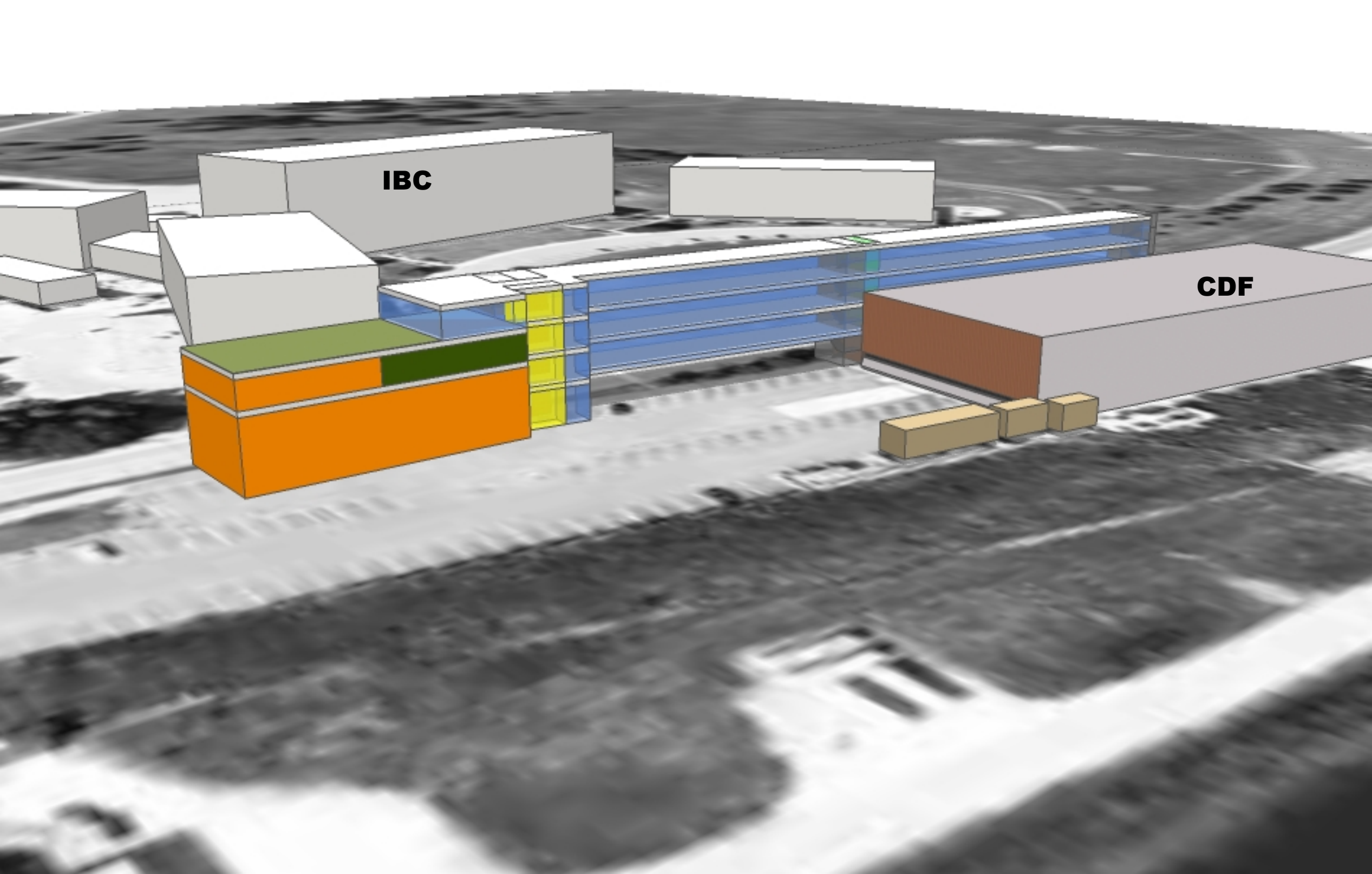
**CDF**



# Low Rise Schemes



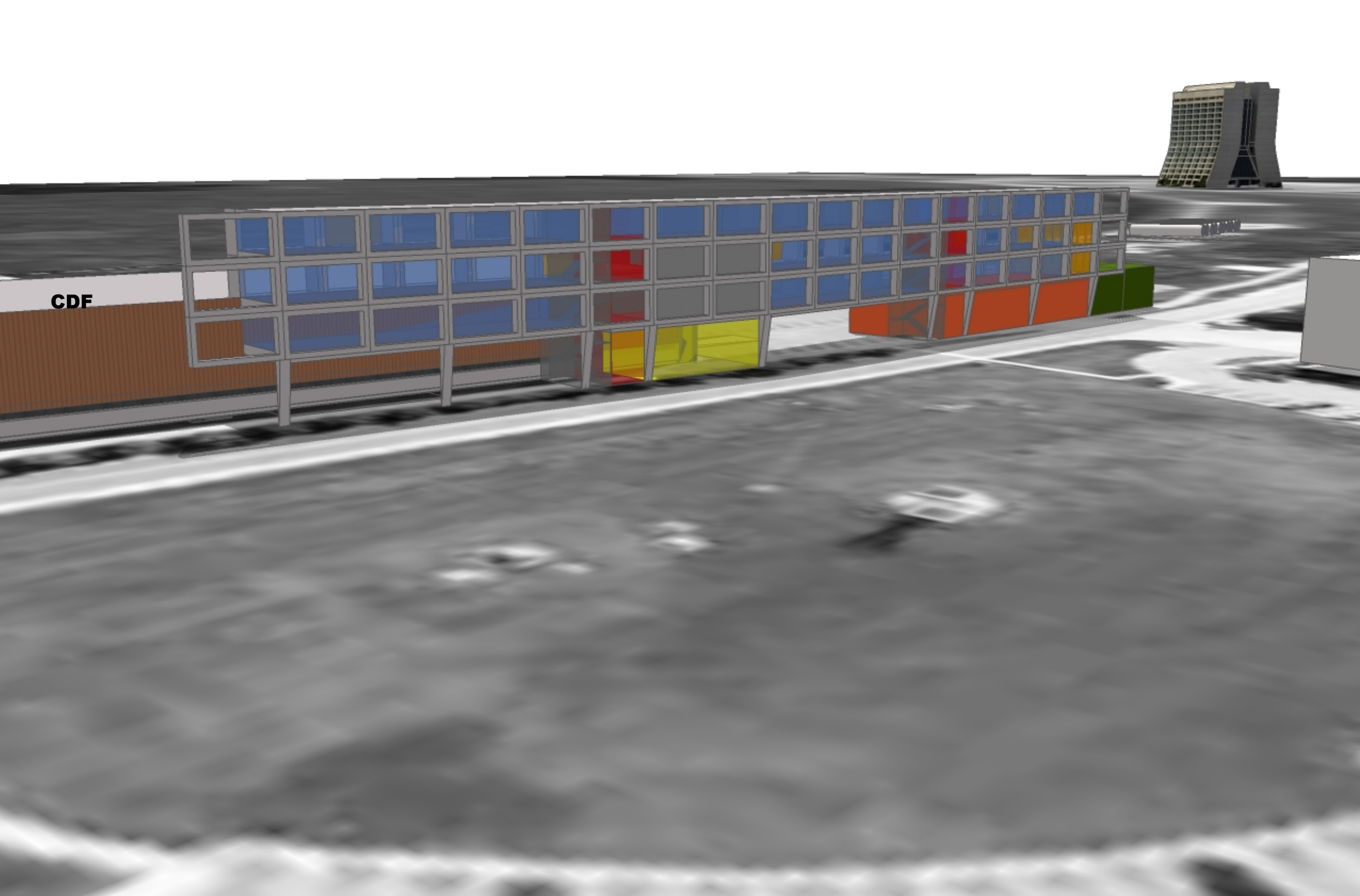




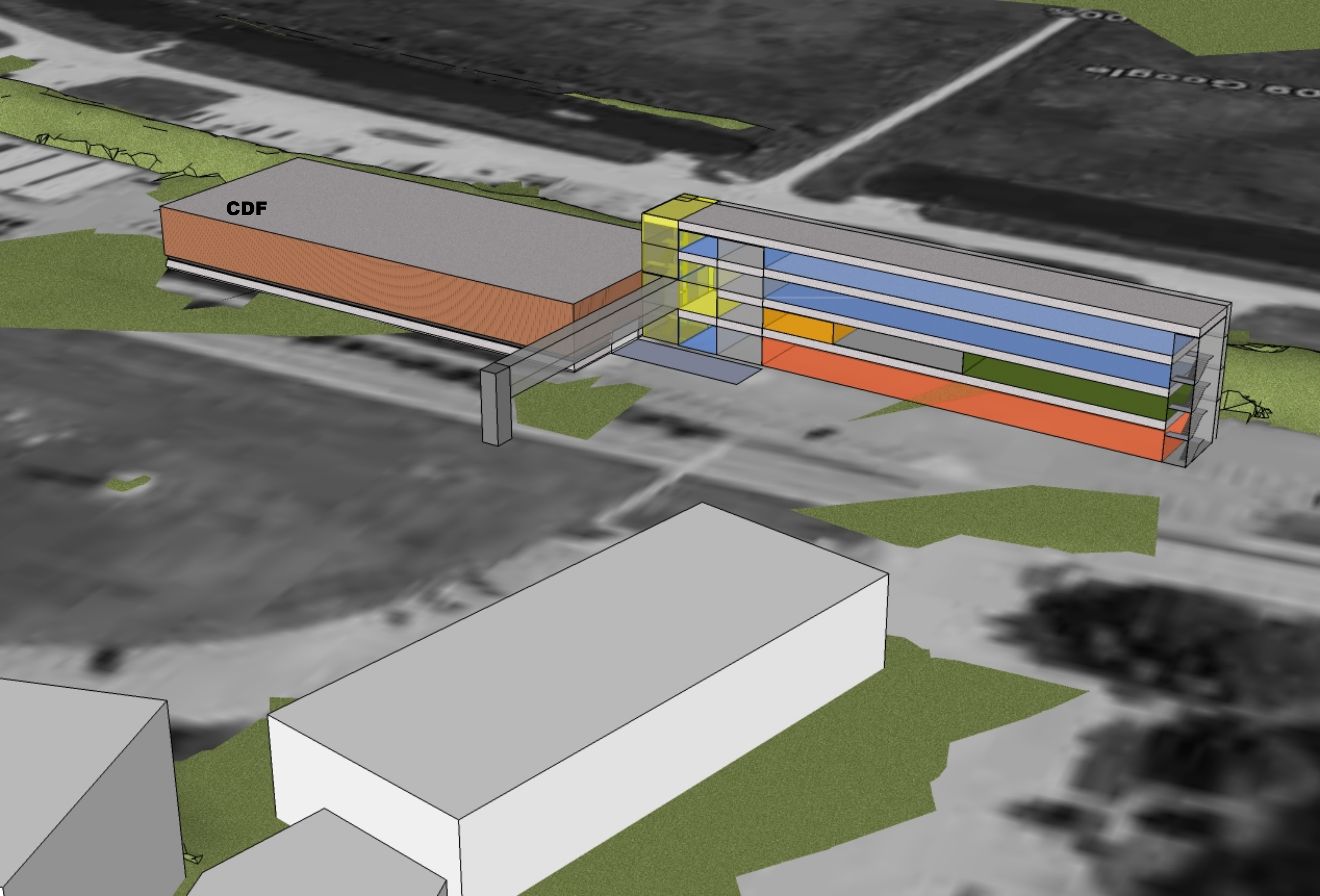
**IBC**

**CDF**

CDF

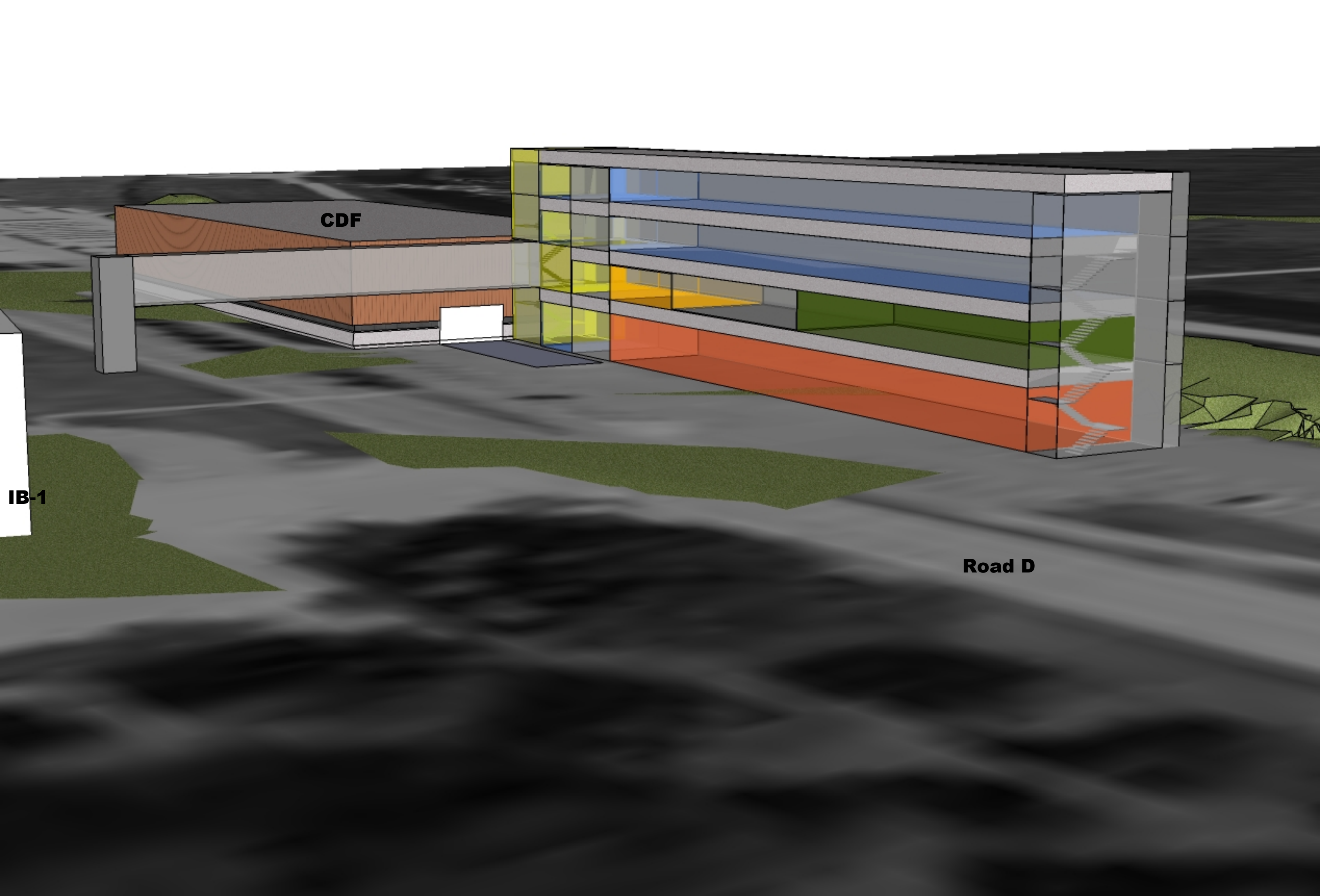






CDF





**CDF**

**IB-1**

**Road D**



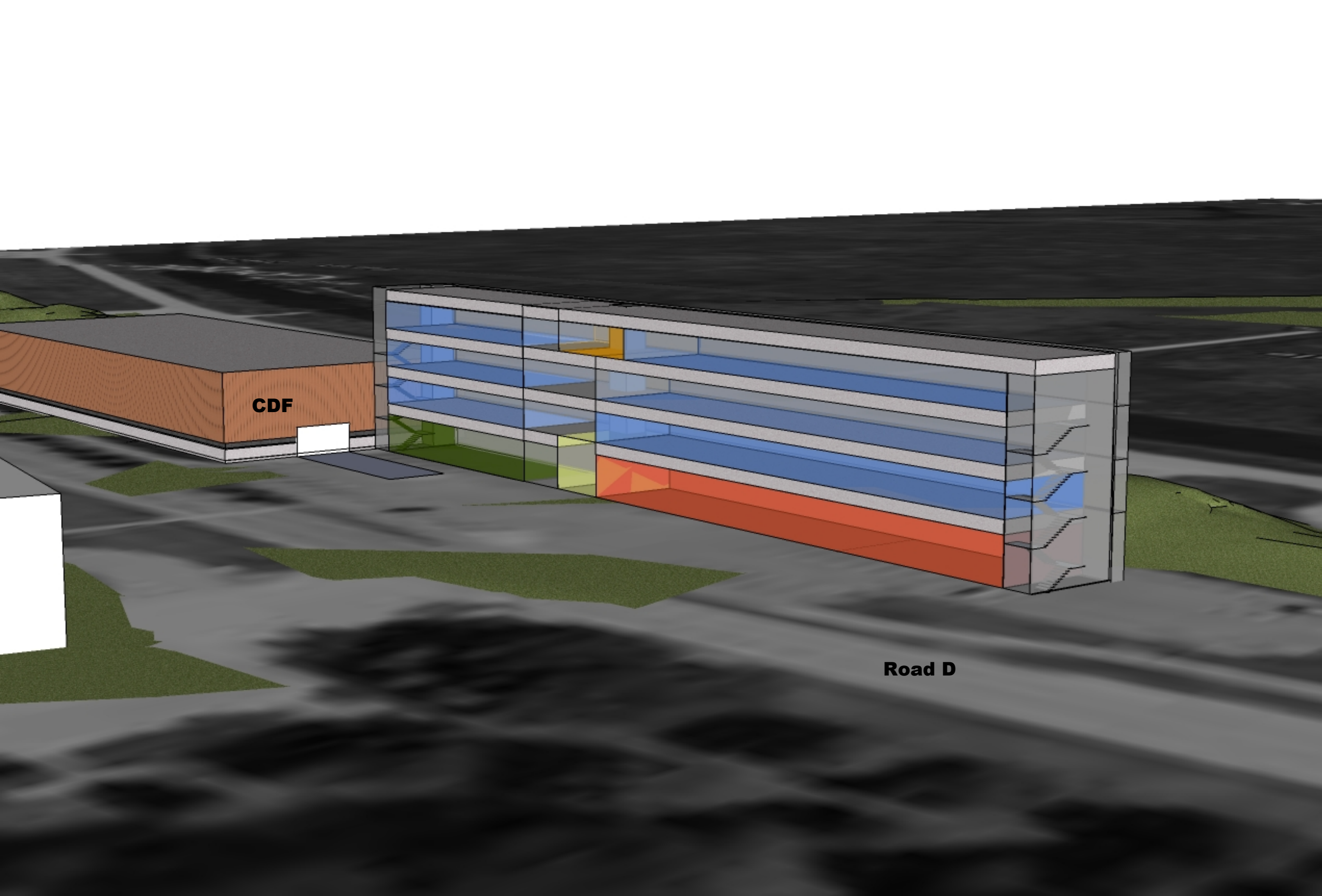


**CDF**

**IB-1**

**Road D**



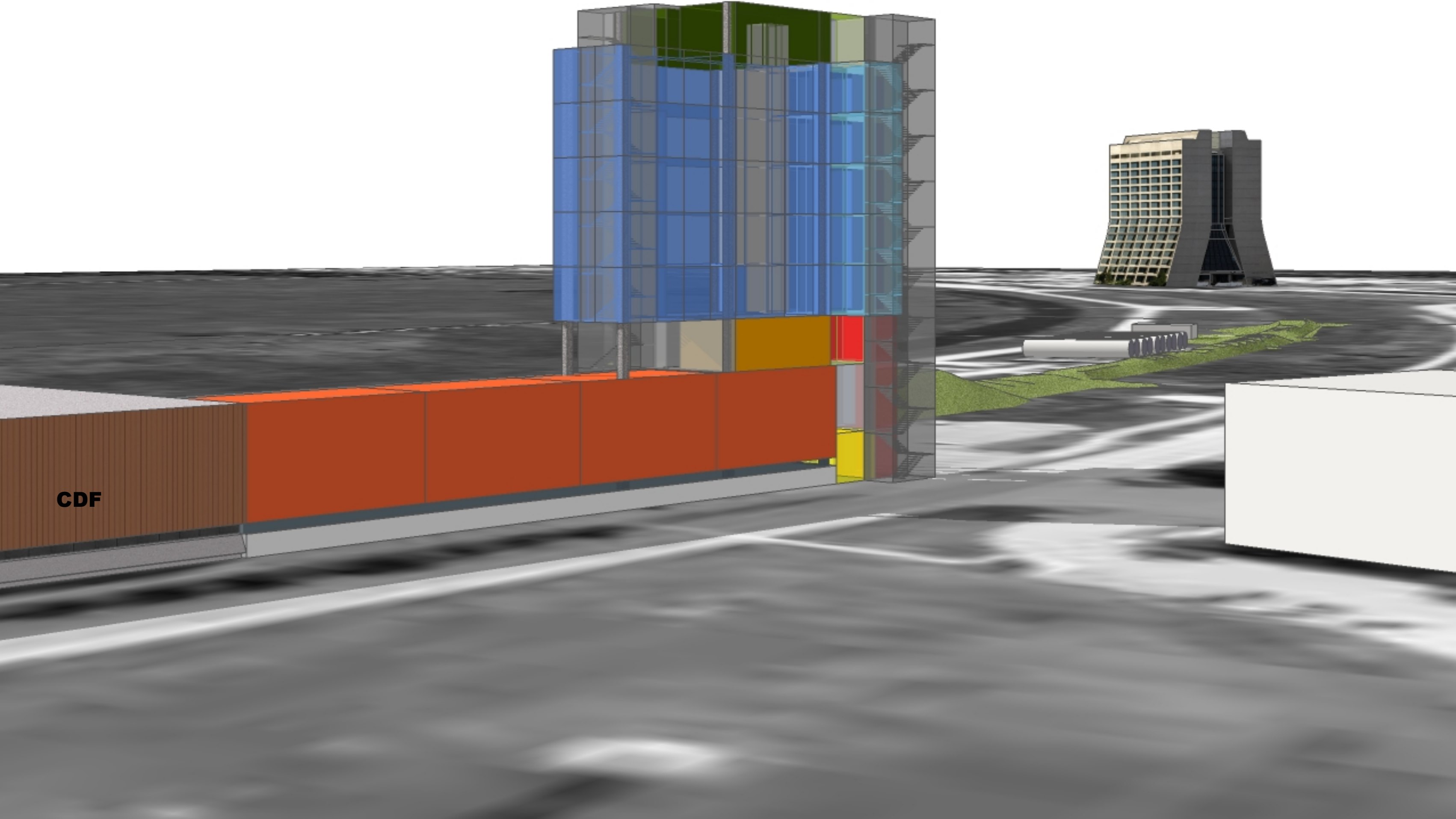


**CDF**

**Road D**



# Tower Schemes







**IBC**

**IB-4**

**IB-1**

**CDF**

**Road D**



## Illinois Accelerator Research Center (IARC) Building Functional Review

### IARC Mission:

Goal: New construction for IARC will be funded via a \$ 20 M grant from Illinois Department of Commerce and Economic Opportunity. The DOE will provide \$ 13 M for site preparation, FESS oversight and to outfit the newly constructed space. A site selection process has occurred and it has been decided that new state funded building will be adjacent to the CDF building. DOE has made a commitment for the D&D of the CDF experiment and to refurbish and contribute the CDF assembly building to serve as both office and heavy assembly area for IARC.

The basic DCEO goal for IARC is to make Northern Illinois a center for accelerator development and initiate/promote/support related industry in Illinois. IARC to provide office space and infrastructure that will increase the probability that new accelerators like Project X and ILC are sited at Fermilab and allow industry to more easily work with us.

Industry and universities have difficulty testing accelerators for medical or industrial purposes in typical university buildings and industrial parks. These same locations often lack the necessary power, water, cryogenic, RF, radiation shielding, interlocks, and other infrastructure necessary to develop new accelerator components. Access to trained accelerator and technology experts is also limited. IARC would provide such assets to industrial and university partners and for laboratory projects.

The IARC proposal includes an educational mission which in association with local universities will support training of scientists and engineers in accelerator physics and related technology.

Secondary goals: Additional office space for TD/AD/APC; Additional conference and meeting rooms.

Outreach: exhibit space for visitors, including members of the public, students and teachers and VIP visitors. The exhibit space would highlight the connections between accelerator technology development, scientific discovery, and accelerator applications in medicine, energy and the environment, industry, and national security.

Possible additional IARC Missions:

- Center for HEP role as “Stewards of Accelerator Development”
- House infrastructure for 3 GeV CW linac in support of ICD-2 (e.g. spoke processing & HPR, cavity dressing, coupler testing, CM assembly, Spoke CM test stand?)

**IARC STATUS:**

Awaiting state funding via sale of bonds, expected to occur in May 2010. The expected time line is such that new state funded construction would be accomplished in two years beginning fall 2010 with beneficial occupancy in 2012-13. D&D of the CDF experiment and refurbishment of the CDF assembly building would take place ~2012-2014. The IARC building conceptual design is in progress with DOE funds using an outside A&E firm. Ross Barney and Associates are now prepared to present two different conceptual designs for consideration by Fermilab.

**Objectives of the new construction:**

- Meet the function needs of the IARC mission
- Achieve good functional relationship to existing CDF building
- Achieve High degree of flexibility for rotating tenants
- Maximize State funding with “bricks & mortars”
- Produce a high profile building making a dramatic statement on the FNAL site
- Produce a design that fits with existing Fermi design themes
- Provide State-of-the-art computing, classroom, and video capabilities
- Maintain CDF truck access and provide adequate parking
- Design to LEED Gold

**Purpose of the Review**

As the member of the Directorate leading IARC I would like to seek advice from experienced FNAL colleagues on the proposed designs before proceeding to a selection and more detailed design and costing.

**Charge for the review:**

- 1) Listen to the RBA presentations
- 2) Evaluate the proposed design solutions and indentify merits and possible problems.
- 3) Will the building layout function for its intended purpose?
- 4) Is the proposed technical space functional?
- 5) Will the planned technical space infrastructure ( power, water, cooling, etc) be sufficient?
- 6) Is the newly constructed space well integrated with a refurbished CDF building?
- 7) Will materials, equipment, and personnel be able to move efficiently around the complex
- 8) Are the proposed solutions for class room and office space reasonable?
- 9) Are there sufficient conference rooms?
- 10) Will the proposed building be visually appealing and prominent?
- 11) Can issues associated with the operation of CDF through 2011 and subsequent D&D of CDF be adequately addressed?
- 12) Provide a few page written report with your recommendations
- 13) Please comment on any other issues the committee feels are relevant.



## **Appendix: Committee Charge**

**Functional Review of Proposed Designs for IARC Building**  
**Report from the Review Committee**

Committee Members: Harry Carter, Paul Czarapata, Steve Holmes (Chair), Mike Lindgren, Rob Roser, Vladimir Shiltsev

Bob Kephart convened an ad-hoc committee (membership listed above) to review the proposed designs of the Illinois Accelerator Research Center (IARC) building with a focus on the functionality of the design. The review took place on February 23, 2010 at Fermilab with an agenda consisting of:

- Discussion of the charge to the committee (Bob and the committee)
- Presentation of concepts by the architects (Ross Barney Architects, the committee, and selected observers/project participants)
- Follow-on discussion (Everyone)
- Committee Executive Session (Bob and the committee)
- Presentation of committee comments, suggestions, recommendation (Everyone)

Bob described the goals of the IARC building as:

Primary Goal: Establish Northern Illinois as a (national) center for accelerator development, and initiate/promote/support related industry in Illinois.

Secondary Goal/Education: In association with local universities, support training of scientists and engineers in accelerator physics and related technology.

Secondary Goal/Office Space: Provide additional office space plus conference/meeting rooms to relieve congestion in TD, AD, and/or APC.

Secondary Goal/Outreach: Provide exhibit space for visitors, including members of the public, students and teachers and VIP visitors.

Bob also described the objectives of the construction as threefold:

- 1) Meet the above described missions
- 2) Preserve a good relationship with CDF building
- 3) Provide flexibility for rotating occupants.

Two design concepts for the IARC building have been developed by Ross Barney Architects for Fermilab's consideration. The purpose of the meeting was to conduct a functional review of these concepts within the context of the mission and goals presented by Bob. In particular the



committee was asked to identify the positive (and negative) attributes of each design in order to form a basis for further development. The committee was not asked to provide a recommendation from among the two designs.

The Committee concentrated its attention on understanding how the design concepts presented would meet the functional requirements necessary to achieve the IARC goals and objectives. The committee appreciated very much the comprehensive presentation prepared by Ross Barney and the presence of knowledgeable staff from Ross Barney to answer questions. The committee's comments, suggestions, and recommendations are given below.

### **Committee Comments, Suggestions, and Recommendations**

We refer to the two building design options as "A" and "B" as follows:

- Option A: A three story building, extending from the west and in front of the north façade of the CDF building.
- Option B: An eight story building located to the immediate west of the CDF building

Both buildings contain roughly 43,000 square feet of combined office, technical, and public floor space; and both provide access into the CDF building via the third floor.

### **Specific responses to the charge and recommendations**

- 1) Listen to the RBA presentations

Done

- 2) Evaluate the proposed design solutions and identify merits and possible problems.

Both options appear to meet office requirements. Option A is more horizontally dispersed than Option B, and features a dead end on the wing that goes in front of CDF. The committee notes that in general communications are more effective between people on a single floor than on separated floors. We also note that Option A is less reliant on elevators to get from floor to floor. Based on these observations we believe that communication between building occupants would be fostered more in Option A than in B.

The 8' × 8' cubicles shown are industry standard, but this is less space than we are accustomed to at Fermilab (Fermilab standards are 9' × 10' cubicles and 10' × 12' offices within Wilson Hall). Option A appears to be less flexible than Option B in terms

of adapting to variable dimensions because of the non-parallel north and south walls. The committee wonders if Option A could be redesigned with a footprint that is a parallelogram rather than a trapezoid.

Both options generally meet educational requirements. There was some feeling that it might be advantageous to have the education function segregated as in Option B. There was not much consideration of the lab space required as part of the educational mission, nor the relationship (if any) between this lab space and the technical areas.

The technical space functional definition is lacking in both options. The committee notes that Option B provides a better opportunity for connection between the technical areas and CDF than does Option A. However, the lack of a defined relationship between the IARC tech area and B0 makes it difficult to have a view as to whether this is important. The committee felt the design would benefit with some modest office space for supervisor(s) in close proximity to the technical space. The committee also feels that it is advisable to keep the tech areas on the ground floor (as done in both options).

There did not appear to have been any real consideration of hazardous materials or processes that would be employed in the technical areas. As a result there were no specific mitigations presented.

The committee notes that Option A has two entrances, whereas Option B has one. The committee felt that the extra entrance could be a plus, however the extra road crossing associated with this entrance is probably a minus.

**Recommendation: Define the functional requirements of the lab/tech space. This will define the needs for power, cooling, cryo capabilities, and the need for direct access to CDF building.**

**Recommendation: Define any requirements for hazardous materials or processes in the technical areas.**

**Recommendation: Determine any requirements for security through discussions with potential industrial occupants and/or ANL.**

**Recommendation: Provide some office space on the same floor as tech areas. The committee felt that only a few (~2) offices would be required.**

**Recommendation: Define requirements for lab space associated with the educational mission and define the relationship, if any, to the technical space.**



**Recommendation: Look at options for providing better connection between the Industrial Complex and the IARC building.**

3) Will the building layout function for its intended purpose?

See above discussion.

4) Is the proposed technical space functional?

See above discussion.

5) Will the planned technical space infrastructure ( power, water, cooling, etc) be sufficient?

This was not specifically addressed. The following are currently in need of definition:

- Lighting requirements – make lighting is sufficient for any possible application
- Crane coverage requirements
- Floor loading, electrical capabilities, temperature and humidity control.

6) Is the newly constructed space well integrated with a refurbished CDF building?

The technical space is the most relevant aspect. It is not directly integrated in either option, but option B offers better possibilities. It needs to be determined if this is a requirement.

Office functions are well integrated in both options.

7) Will materials, equipment, and personnel be able to move efficiently around the complex

Truck access to the west ramp of the CDF building for a truck approaching from the west appears problematic in both options. In addition the committee feels that the need for significant foot traffic coming across Road D for access to the IARC building from the parking lots is a potential hazard.

The committee also notes that there is likely to be significant pedestrian flow between the IARC building and the Industrial Complex because of the nature of the activities in IARC.

**Recommendation: Provide good truck access to the CDF west ramp for trucks approaching from the west.**

**Recommendation: Look for solutions to the potential hazard from significant foot traffic crossing Road D from either the Industrial Complex or from the parking lots to the north of IARC.**

8) Are the proposed solutions for class room and office space reasonable?

Yes, see above discussion.

9) Are there sufficient conference rooms?

Generally yes. The committee feels it is important to retain the central gathering point (the lunch area) that is a feature of both designs presented.

10) Will the proposed building be visually appealing and prominent?

The committee views both options as sufficiently visually appealing to be considered. A majority of the committee felt that Option A was more visually appealing, but this view was not unanimous.

11) Can issues associated with the operation of CDF through 2011 and subsequent D&D of CDF be adequately addressed?

West side access to CDF building is required and accommodated in both options.

12) Provide a few page written report with your recommendations

13) Please comment on any other issues the committee feels are relevant.

The committee is concerned about the location of the bike path (option A), in particular the free space between the bike path, the CDF building, and the IARC building. A survey by several committee members after the meeting indicates that the bike path will not fit between the road and building in Option A. It appears that this option will require relocation of either the road or the bike path.

It is important to think of expansion options during the design phase. The committee believes that both options have opportunity for expansion.



# OPTION A – FAÇADE SCHEME



*view from northwest*

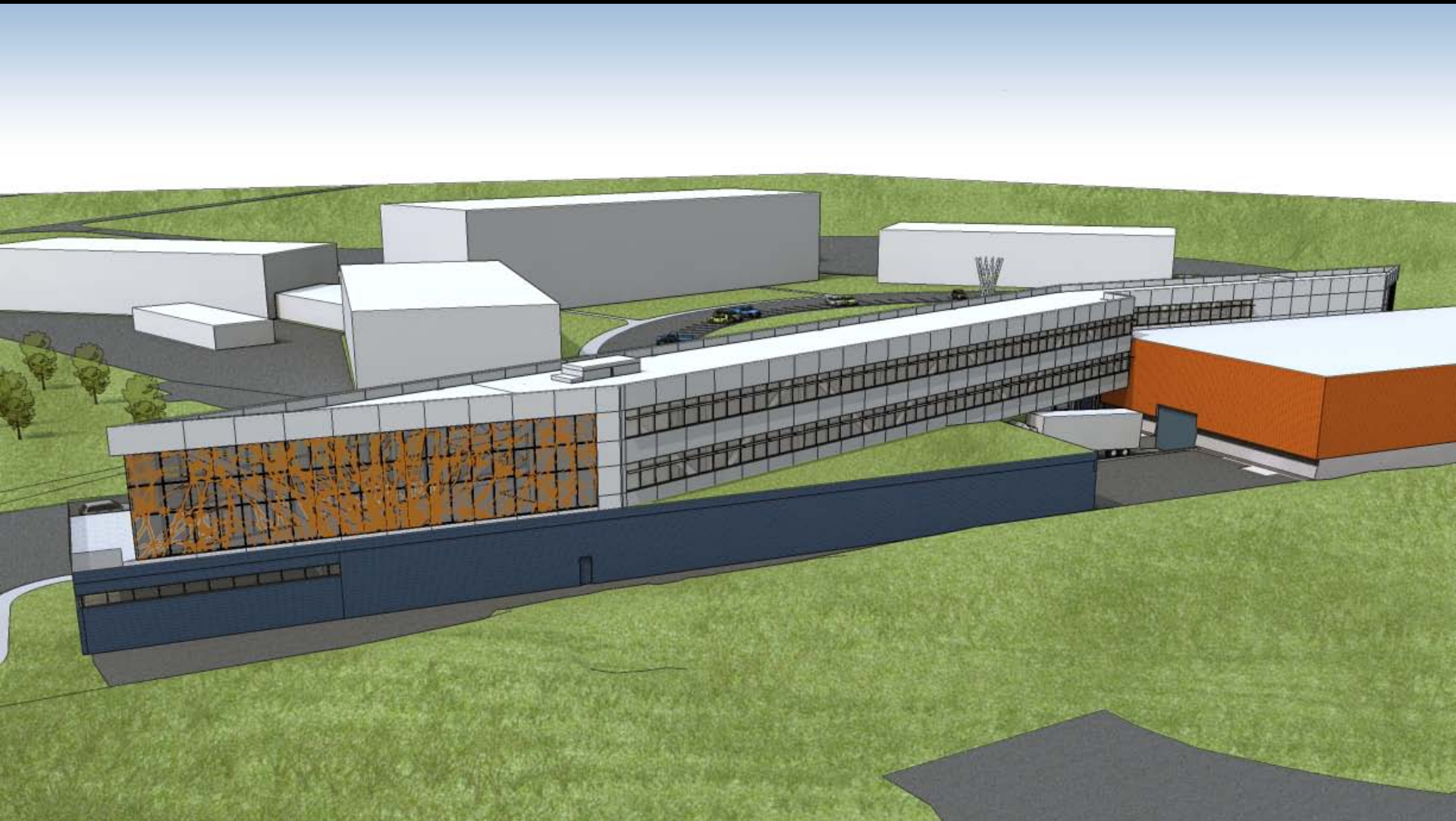
# OPTION A – FAÇADE SCHEME



*view from northeast*



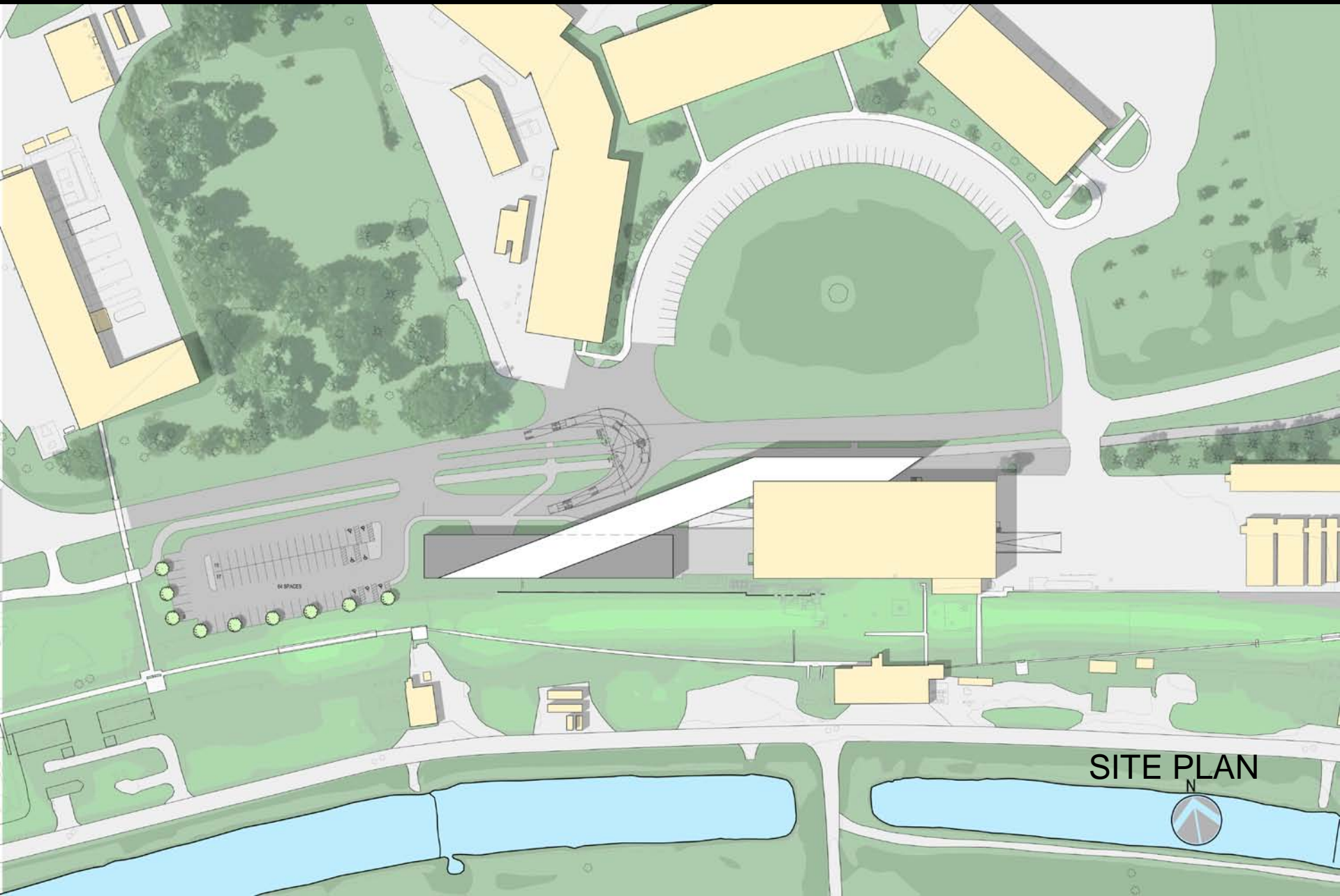
# OPTION A – FAÇADE SCHEME



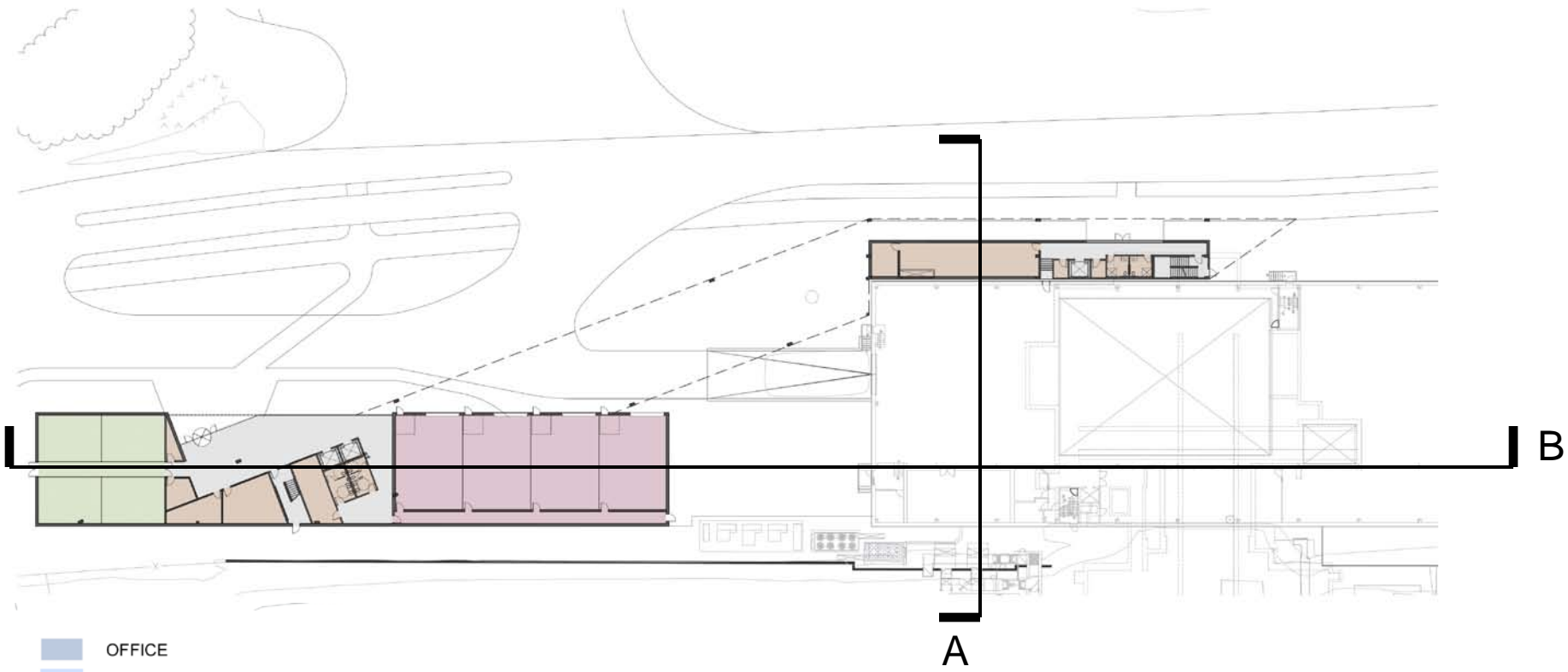
*view from southwest*



# OPTION A – FAÇADE SCHEME



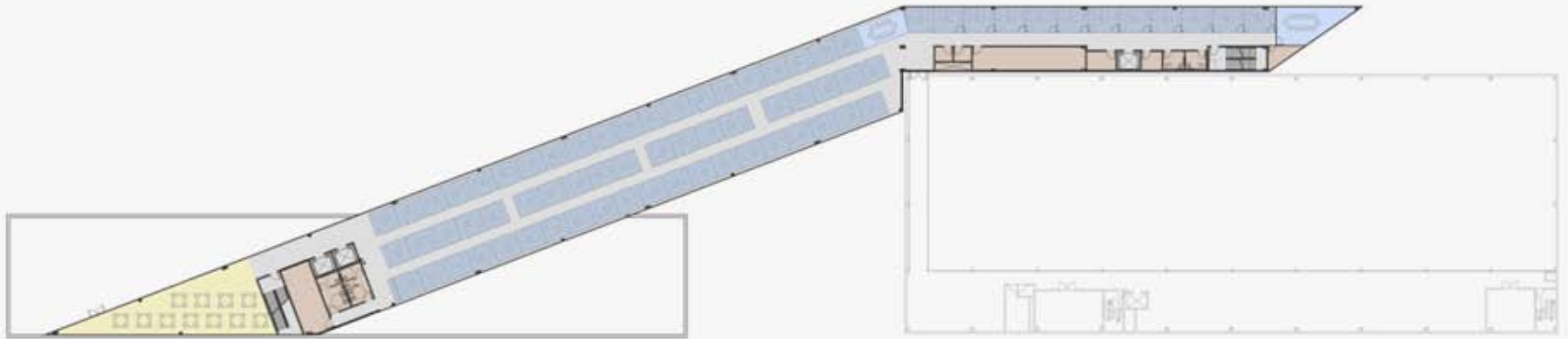
# OPTION A – FAÇADE SCHEME



- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

**GROUND FLOOR**  
14,600 GSF  
EL 0.0

# OPTION A – FAÇADE SCHEME

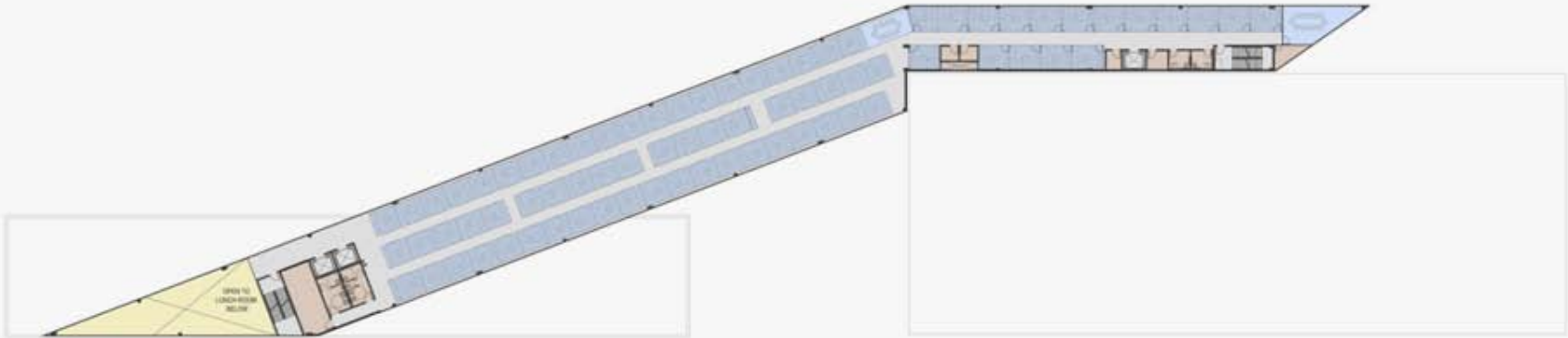


- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

**SECOND FLOOR**  
15,300 GSF  
EL +19.0



# OPTION A – FAÇADE SCHEME

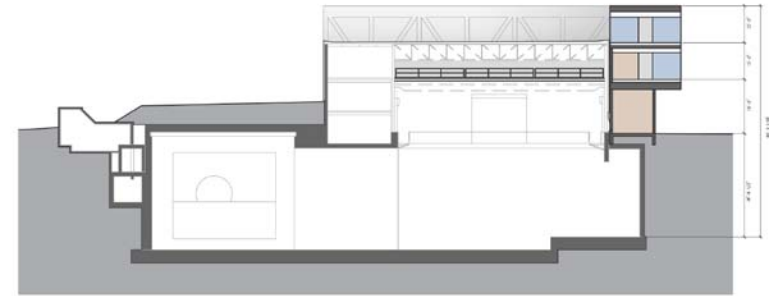


- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

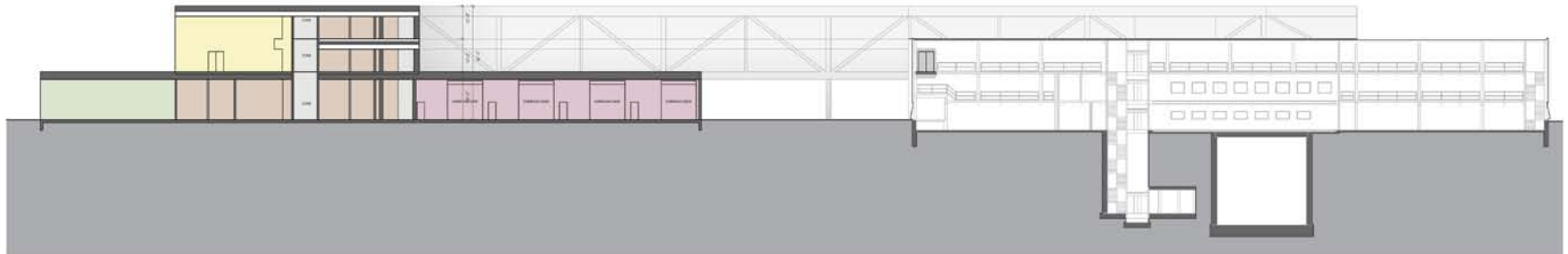
**THIRD FLOOR**  
15,300 GSF  
EL +32.0

# OPTION A – FAÇADE SCHEME

- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION



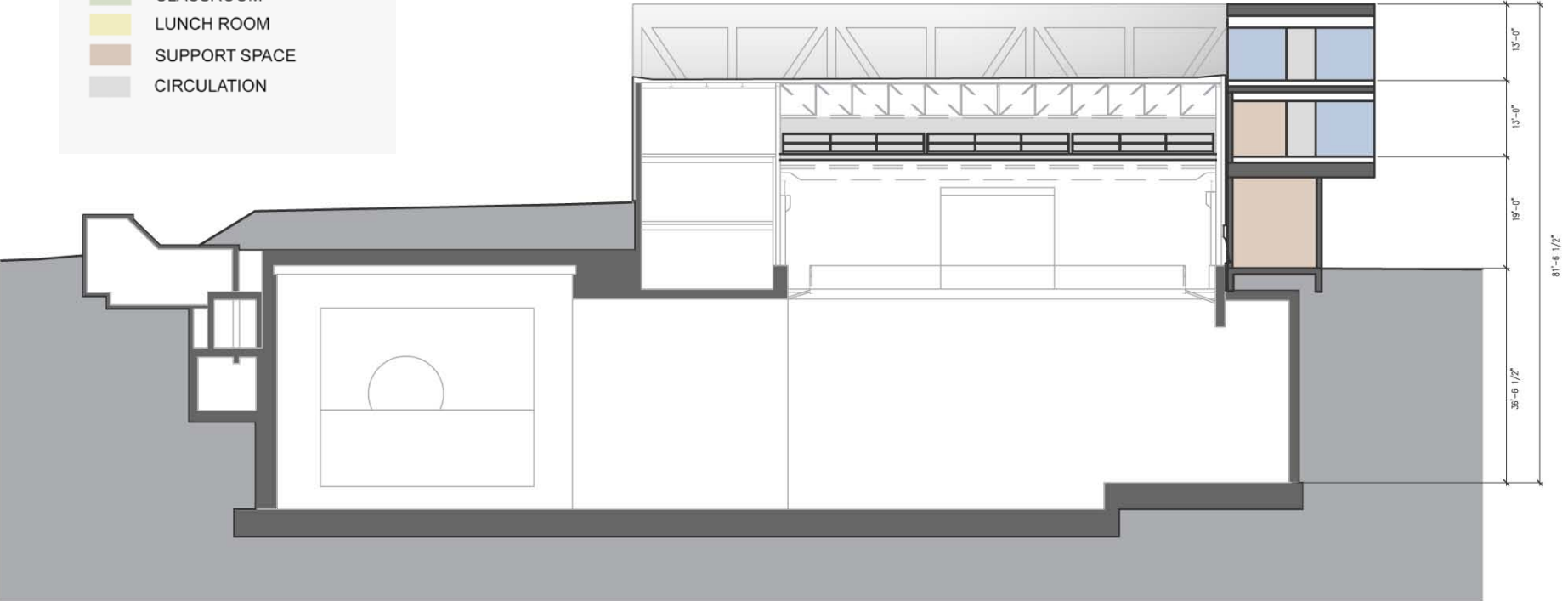
SECTION A



SECTION B

# OPTION A – FAÇADE SCHEME

- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION



SECTION B - ENLARGED



# OPTION B – TOWER SCHEME



*view from northwest*

# OPTION B – TOWER SCHEME



*view from northeast*

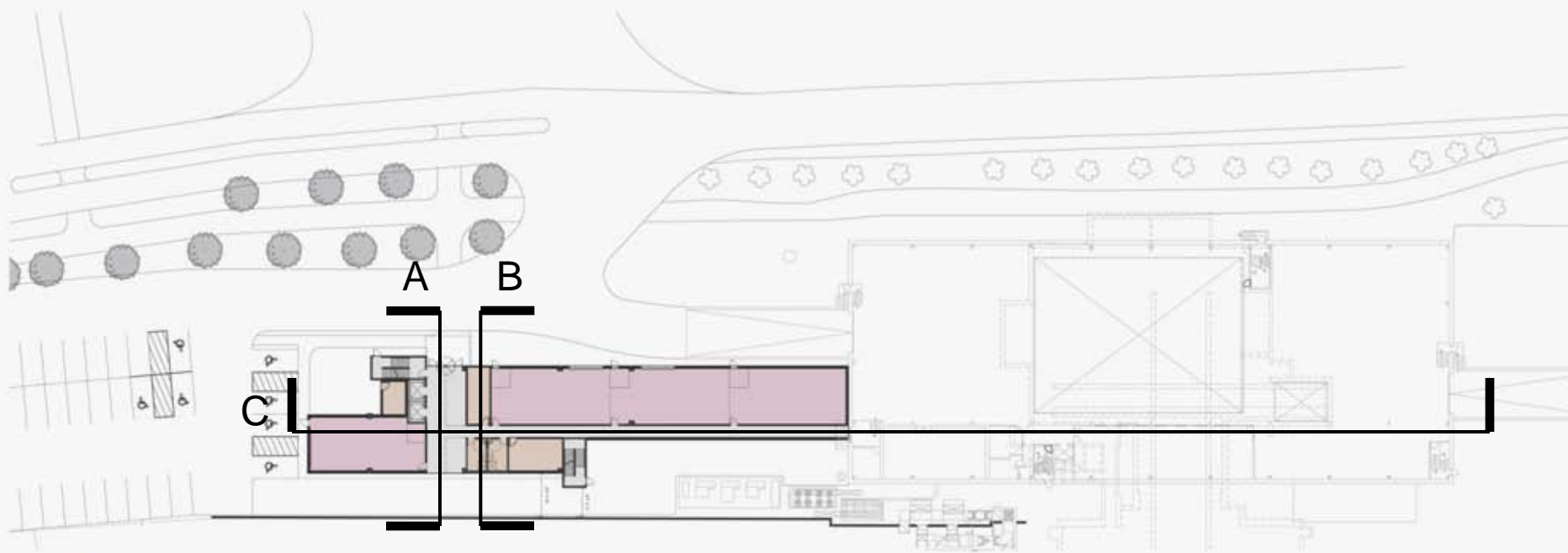
# OPTION B – TOWER SCHEME



*view from southwest*



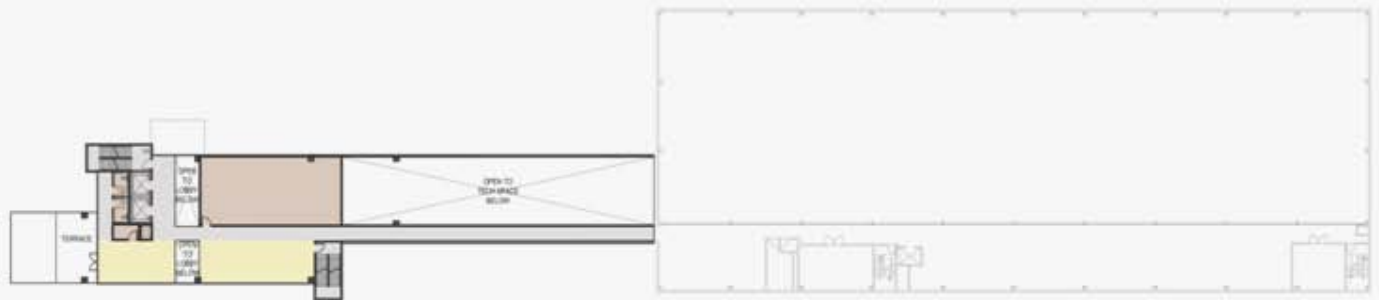
# OPTION B – TOWER SCHEME



- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

GROUND FLOOR  
8,230 GSF  
EL 0.0

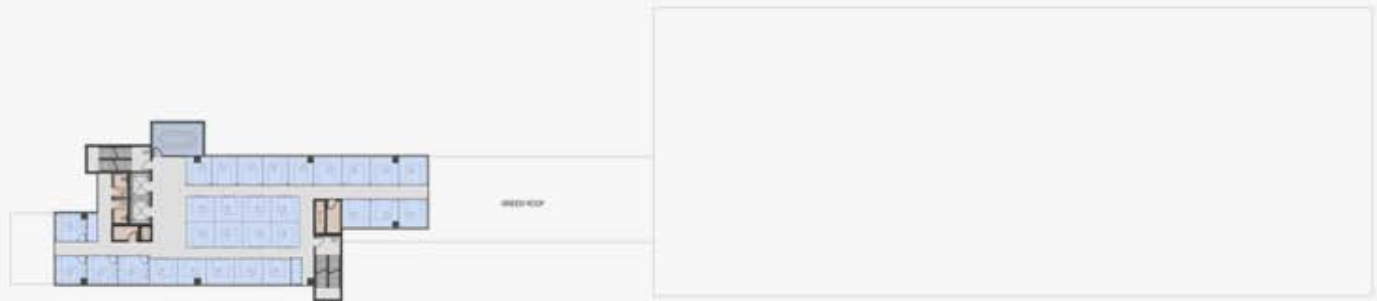
# OPTION B – TOWER SCHEME



- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

**SECOND FLOOR**  
4,475 GSF  
EL 19.0

# OPTION B – TOWER SCHEME



- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

FLOORS 3 - 7  
5,560 GSF



# OPTION B – TOWER SCHEME



- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

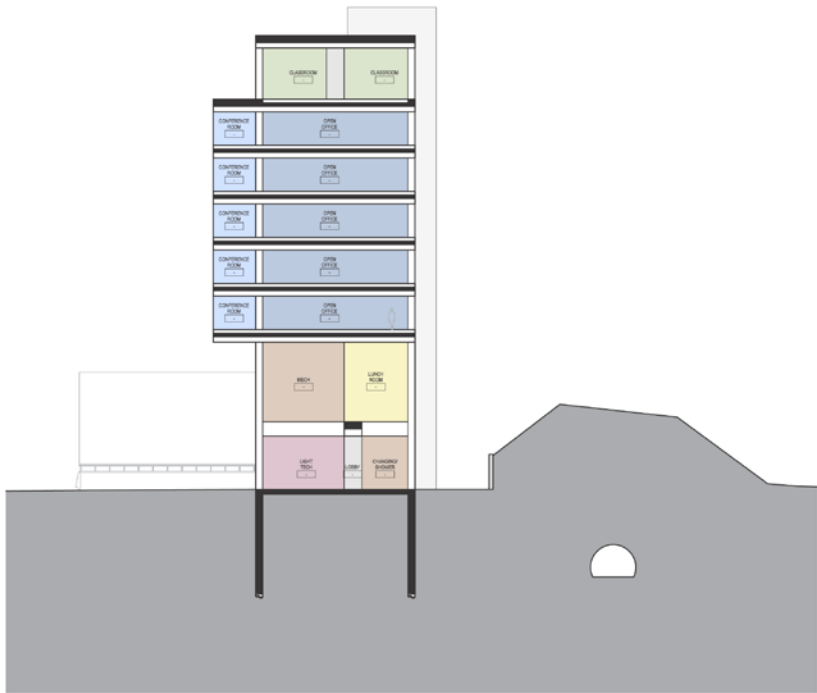
FLOOR 8  
4,140 GSF  
EL 110.0

# OPTION B – TOWER SCHEME

- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION



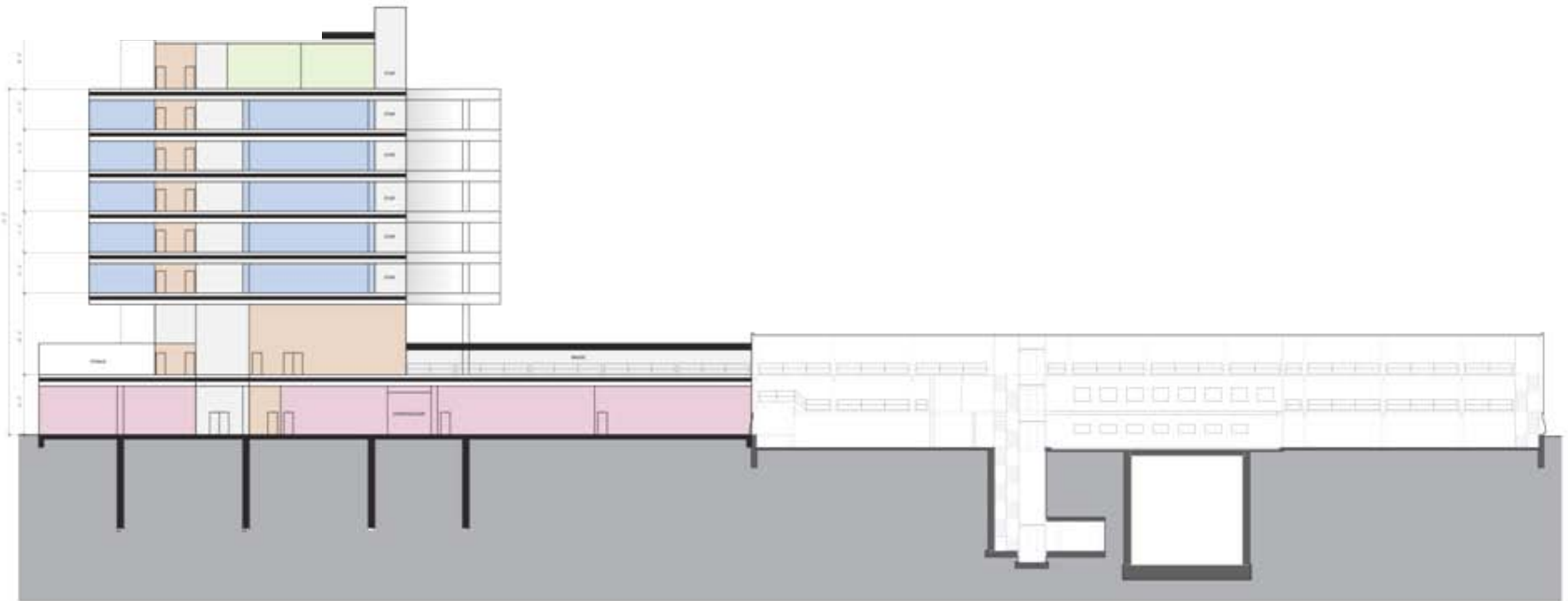
SECTION A



SECTION B

# OPTION B – TOWER SCHEME

- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION



SECTION C



# OPTION B – TOWER SCHEME



- OFFICE
- CONFERENCE ROOM
- TECH SPACE
- CLASSROOM
- LUNCH ROOM
- SUPPORT SPACE
- CIRCULATION

FLOORS 3-7 - ENLARGED  
5,560 GSF

