NEW YORK CITY
COLLEGE OF TECHNOLOGY
THE CITY UNIVERSITY OF NEW YORK

DEPARTMENT OF ARCHITECTURAL TECHNOLOGY

ARCH 2430 **BUILDING TECHNOLOGY IV** **September 2013**

Façade cladding research assignment
You will spend a lot of time developing your exterior façades of your project. This research assignment will be part of your final project. All of the topics studied will help you complete your drawing set. The more research and development you do in this project, the more information and details you will have available when you develop your façade drawings and construction documents.

Team assignments
Each student team will select two of the following exterior cladding systems to research:

1. Glass curtain wall
2. Masonry wall system; brick & CMU veneers
3. Metal panel, rigid with insulation
4. Metal panel, sheathing over wall assemblies
5. Precast concrete panels
6. GFRC (Glass fiber reinforced concrete) panels
7. Stone veneer panels (granite, limestone, & ect. Façades)
8. Rain screen terra-cotta & fiber panel
9. Exterior Insulation and Finish Systems (EIFS) [optional topic by permission]
10. Green wall systems [optional topic by permission]
11. Composite wood paneling systems[optional topic by permission]
12. Photovoltaic façade paneling systems [optional topic by permission]

Research topics
Each team will divide the research work up among its members. Each team member will select two of the subjects below as their focus. Research topics will vary depending on the system under investigation. The topics with * are required. Each team must be sure that all required topics are assigned and submitted.

1. Air barriers and sealants*
2. Attachment systems and fire safety*
3. Case study buildings *
4. Rain penetration and moisture control *
5. System joints and connections*
6. Systems comparisons*
7. Thermal insulation and R values*
8. Construction time and cost
9. Environmental implications and sustainability
10. External architectural finishes and durability
11. Historical systems compared to contemporary systems
12. Internal options finishes and connections to partition walls
13. System flexibility forms, sizes, effective spacing
14. System movement and seismic resistance

1. Air barriers and sealants [required topic]:
Explain how the system you are examining controls air movement from inside and outside the material. Include at least one diagram. Explain where and how connections are sealed. What kinds of seals are best? Show the details of this system including where the air barriers and sealants are located.

2. Attachment systems [required topic]:
Research the way in which your cladding system is attached to the structure of the building. You need to show at least two sections and two plans details of this connection.

3. Case study buildings [required topic]:
Select the building of architectural note to document. Document the building cladding system. How does the system work architecturally with the rest of the building? How is this type of system used to integrate with the rest of the architecture of the building? Describe why you think that particular system was selected for this project. Images, details and analysis should be submitted for this topic.

4. Rain penetration and moisture control [required topic]:
How is water kept outside the building? Are there backup systems for water protection? Where does the moisture collect and how is it collected and disposed of?

5. System joints and connections [required topic]:
Show how the cladding system connects to itself. Include at least, corner conditions, unit (panel) connections, and openings (doors and windows). This should be explained using detail drawings.

6. Systems comparisons [required topic]:
Compare at least three similar systems by different manufacturers and weigh the merits and disadvantages of each. This analysis should look at the systems in the context of the building they will be covering. The comparison should be in the form of a chart. The chart should rate the different attributes of the systems. A good example of some attributes to compare would be insulation rating, ease of construction, assembly cost, availability of construction details, and damp proof/waterproof effectiveness. This submission should be in the form of an Excel chart.

7. Thermal insulation and R values [required topic]:
Show how the exterior wall assembly is insulated. Examine possible areas of thermal bridging (where the insulation is not effective). Give the R-value (thermal resistance) for the exterior cladding assembly. Use sections and plan drawings to illustrate the location and functionality of insulation system.

8. Construction time and cost:
What are the overall costs of the system? Which parts of the cladding system are most costly? How labor-intensive is its construction and how skilled the workforce need to be? How quickly can the system be assembled on site?

9. Environmental implications and sustainability:
Investigate the environmental impact of the cladding system. Consider such factors as how the system protects the building solar heat gain. Is the exterior cladding material long life or will it

need to be replaced periodically? How much imbedded energy was used to create the cladding system?

10. External architectural finishes and durability:
What kind of colors textures, shapes and forms are available for this system? How strong are those surfaces, how well they will they be able to resist weathering.

11. Historical systems compared to contemporary systems:
Compare the techniques used in the past for your cladding system with those of today. What are the biggest changes? How do they affect the architectural possibilities?

12. Internal options finishes and connections to partition walls:
What are these particular cladding systems interior surface options? What types of finishes are available? Are there any special requirements for connecting walls and partitions to the cladding?

13. System flexibility forms, sizes, effective spacing:
What kind of shapes and sizes does the system allow? Be specific, give dimension ranges. Include minimums, maximums and effective spacing (least expensive, most commonly used).

14. System movement and seismic resistance:
Where is flexibility built into the system? Where can the system change dimensioned based on changing temperature wind and seismic activity? What techniques are used to achieve this flexibility? Show these movement connections in sections, plans and diagrams.

Submittals
All submittals need to be posted up to the openlab website:
[http://openlab.citytech.cuny.edu/buildingtech4posts/] before their due date. Your team will present their work to the class from the files posted on the website. Remember to categorize your posting with the class section you are part of. Be sure to reference your sources and images in your presentations.

Resource
Each team will keep three resource folders on the G-team site in their “façade systems draft” folder. Name the folders as follows: “details”, “reference” and “presentation” One folder will contain general information These folders should be up-to-date reflecting the current level of research done by the team.

Draft
You will be required to submit a draft of this research assignment. This draft assignment is due in about three weeks.

Final
This assignment coincides and supports the development of your building elevations. This must be a comprehensive presentation containing lots of details and specific examples. You will present directly from the open lab websites. Be prepared to give a 10-15 minute oral presentation (approximately 4 minutes per team member)

Resources:
http://www.wbdg.org/design/env_wall.php