Learning Space Design Guidelines 2018

Contents

APPENDICES

Section 1: Introduction

1.1 PURPOSE

The Learning Space Design Guidelines (LSDG) for The University of British Columbia (UBC) is a standard document for the planning and design of learning spaces. This guideline is intended to be used on both the UBC Vancouver (UBC-V) campus and UBC Okanagan (UBC-O) campus for the Project Team – Facilities Planning, Campus Planning and Development, UBC IT Audio Visual, Media and Classroom Services, Project Managers, Architects, Consultants, and UBC building users.

The LSDG provides direction and recommendations, rather than specifications, and excludes technical considerations found in the UBC Technical Guidelines. The specific intentions in the LSDG include:

1. Minimizing design and construction-related issues that negatively affect learning spaces.
2. Standardizing design features for learning spaces.
3. Documenting learning space aspects critical to supporting users.
4. Minimizing change orders and helping to save on project costs.
5. Providing a means to assist in communications between Project Team members and other UBC stakeholders.

learningspaces.ubc.ca
learningspaces.ok.ubc.ca

The reader is encouraged to follow references throughout this document that link to the UBC-V and UBC-O Learning Spaces websites.

Learning space projects may include:

- New construction: design and construction of new space, requiring full compliance with the Guidelines.

- Renew and renovations: typically have pre-defined structural grids, building widths, and other fixed elements. Therefore, full compliance with the LSDG may not be possible but will nevertheless be pursued to the extent practical.

The LSDG are not for specialized teaching laboratories (e.g. computer labs, chemistry labs, fine arts studios, etc.)

1.2 METHODOLOGY

The original Learning Space Design Guidelines (LSDG) was prepared in 2011 with various updates introduced through to 2014. The original 2011 LSDG was prepared with assistance and input from a Working Committee, in addition to consultation with the Centre for Teaching Learning and Technology, and UBC user groups from 13 different faculties and departments representing administrative and technical support groups, organizations and interests, as well as instructors and students. A thorough review and compilation of other institutions' related learning space design guidelines were also completed for the original 2011 LSDG.

In 2018, the LSDG was updated under the direction of UBC Facilities Planning and in consultation with units and groups from UBC-O (Facilities Management, Project Services, Risk Management Services, Enrolment Services, Centre for Teaching and Learning, IT, Media and Classroom Services); and UBC-V (Centre for Teaching, Learning and Technology, Information Technology, and Access and Diversity).

The primary objectives for the 2018 update were to:

1. Review content to include UBC-O campus-specific guidelines.
2. Have guidelines adopted for use on the UBC-O campus.
3. Reduce overall document volume and redundancy by removing sections that are no longer relevant or are already included in other UBC documents and websites.
4. Review and update relevant metrics, terminology and descriptions.
5. Reformat the document to make it more user-friendly.

1.3 ROLES & RESPONSIBILITIES

The Vancouver campus and Okanagan campus have different organizational structures. For ease of reference, the following terminology will be used when referring to the functions of the unit and/or groups:

PLANNING TEAM	Vancouver	Facilities Planning, Infrastructure Development
	Okanagan	Space Planning, Campus Planning and Development
AUDIO VISUAL TEAM	Vancouver	Audio Visual Services, Information Technology
	Okanagan	Media and Classroom Services, IT, Media and Classroom Services

Key responsibilities in the planning, design and construction of learning spaces include:

1. During the Functional Programming stage, the Planning Team is included as a user group and a member of any decision-making committee when the project includes learning spaces.

2. For each new construction, renew, and major renovation project which include learning spaces, the Planning Team and the Audio Visual Team are both user groups on the Working Committee or its equivalent. The Planning Team will act to balance the interests of the University with the interests of the Client (i.e., faculty, department, or program) and provide direction to the design team. Both the Planning Team and the Audio Visual Team will participate in decision-making, reviews, approvals, and will provide input at each stage of the design and development process. The Planning Team and the Audio Visual Team will follow through from project construction to final commissioning.

3. Smaller learning space renovation projects may not have Working Committees or their equivalents. In these cases, the Planning Team and the Audio Visual Team will be included as members of any other project decision-making committee.

Each UBC campus has an Advisory Committee for Learning Spaces. The Advisory Committees make recommendations for learning space priorities including budget, projects, scheduling, and overall stewardship of learning spaces.

1.4 TECHNOLOGY

At the outset of schematic design, the design consultant will conduct a Learning Technologies meeting to review learning technology options, trade-offs and the related implications on pedagogy, room design and budget. The Learning Technologies meeting will include the Client (faculty, department, program representatives), Centre for Teaching, Learning and Technology (UBC-V) or Centre for Teaching and Learning (UBC-O), the Planning Team, and the Audio Visual Team. The purpose of this meeting is to minimize potential conflicts between user pedagogical aspirations and the technical and operational requirements of learning technology systems.

1.5 REVIEW AND APPROVAL PROCESS

At each stage of the project, the project schedule should accommodate sufficient time to allow the Planning Team and the Audio Visual Team to review and approve the first, interim, and final draft documents. Please see the illustration below.

1. Functional Programming	2. Schematic Design	3. Design Development	4. Tender Documents & Approval	5. Construction Variances	6. Commissioning

Planning Approval Milestones

Working Committee Approval Milestones
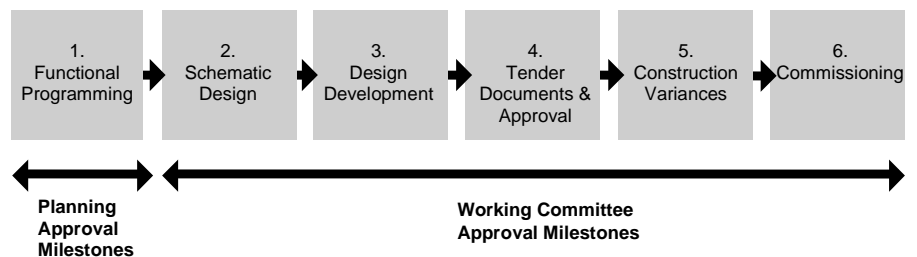
At early budget development stages, a Learning Technologies budget line item will be identified by or in consultation with the Audio Visual Team.

At each stage of the design process, design consultants will provide scaled drawings for review. Drawings will include sufficient detail to ensure it is in compliance with the functional program, the LSDG, and the Working Committee or equivalents' directions.

Design consultants will provide comprehensive documentation of AV, electrical, lighting, interior finish, acoustical, mechanical, and structural design. Design consultants will provide furniture specifications for review in a format and level of detail specified by the Planning Team. The Planning Team will be consulted on preparation of all relevant room data sheets.

The Planning Team may request a review by the Working Committee if there has been a significant delay between stages of the design and development process, or if key concepts related to pedagogy have changed. This is to ensure common understanding and opportunity for revision before the design team proceeds to the next stage.

1.6 OTHER REFERENCE DOCUMENTS

www.technicalguidelines.ubc.ca

It is essential that the UBC Technical Guidelines be reviewed along with the LSDG in order to fully understand UBC requirements.

The UBC Technical Guidelines outline the principles of design and construction and include performance objectives, technical requirements, recommended practices, project documentation requirements, sample front-end documentation, plus steps to follow to expedite completion of UBC projects.

The LSDG is intended to augment information included in the UBC Technical Guidelines, the BC Building Code and the BC Building Access Handbook, and not to re-state the criteria therein. These documents will be consulted and any conflicts with the LSDG will be resolved through discussion with the Planning Team.

1.7 LSDG UPDATES

A periodic revision of the LSDG is required in order to remain current and consistent with the UBC Technical Guidelines. The recommendation is once every three years with interim changes compiled annually. The Planning Team will act as a repository for new concepts, information and updates, and any required changes that may arise in the interim.

Section 2: Principles for Learning Space Design

2.1 INTRODUCTION

There are six principles to be considered when designing learning spaces. Each principle has an overarching statement with examples, plus questions to consider while reviewing the design guidelines.

1. **Interaction**
2. **Technology**
3. **Environment**
4. **Flexibility**
5. **Accessibility**
6. **Location**

2.2 PRINCIPLES FOR LEARNING SPACE DESIGN

1.

Interaction

Enable meaningful, active and collaborative interactions between participants (student to student, student to instructor, instructional team).

a. Furniture supports collaboration and group work.

b. Participants can move around the room easily and instructional processes can occur anywhere in the room.

c. Appropriate acoustics for a wide range of activities so that all participants can effectively hear each other.

d. Table and wall surfaces support student work (e.g. multiple marker boards, projection surfaces/video displays, maker equipment).

Design checklist questions:

☐ *Will the space layout and circulation support **instructor movement** throughout the space, and provide the instructor with opportunities to make easy eye contact with students?*

☐ *Will the space layout and furniture promote **collaborative, discussion based student work** with appropriate discussion aids?*

2.

Technology

Provide appropriate technology to support diverse, enriched and flexible instructional practices and learning experiences.

a. Balanced design response to the requirements of learning technologies, room furniture flexibility, and interaction.

b. Capacity for students to access marker boards and to project or display on multiple surfaces throughout the space.

c. Ubiquitous, high quality internet access.

d. Capacity to capture the products of learning including presentation content and interactions.

e. Common instructional experiences in all learning spaces in terms of technology systems, capacities and controls.

f. AV and room lighting systems that facilitate all of the intended functions of the room (e.g. interaction, marker boards, note taking by participants, image projection, intuitive and straightforward lighting controls).

g. Technology mediated interaction as appropriate (e.g. in room communication/ presentation systems).

h. Infrastructure that will facilitate the incorporation of new/additional technologies at a future date.

Design checklist questions:

☐ *What types of **technology and media** are required to make this an effective space for learning and instruction? How does your design support capturing the products of learning and have you considered if the room needs to support video-conference or distributed education?*

☐ *Have you fully considered the location, design and required number of **power sources**?*

3. **Environment**	**Design a sustainable and healthy environment that is conducive to learning, and will support the long-term use of the space.**

a. HVAC, acoustical controls, ambient noise levels and lighting that fully support intended teaching and pedagogical use cases.

b. Furniture that is comfortable, ergonomic, and robust.

c. Inviting, welcoming ambience that supports accessibility.

d. Environmentally sensitive and sustainable approaches in constructing, operating, and fitting out learning spaces.

e. Materials and technical infrastructure that are robust and result in longevity, serviceability, and ease of maintenance.

f. Room controls that are intuitive, simple to operate, and fully integrated with learning space AV system.

Design checklist questions:

☐ *How have you **'future proofed'** the design towards making it operationally sustainable in terms of cleaning, maintenance, waste disposal, light bulb replacement?*

☐ ***Colour, materials, light, acoustics, ambient noise,** and **temperature** can have an effect on the user's learning experience and well-being – have you fully considered these factors? How have you made these features in your design conducive to learning?*

4. Flexibility

Design for a wide range of instructional practices, student activities, curricula, room uses, and potential for change.

a. Depending on the space, provide easily moveable furniture that supports quick changeovers and varying instructional practices.

b. Design flexible and scalable technical infrastructure, power, seat capacity, and furnishings.

Design checklist questions:

☐ *Are you clearly aware of what **instructional practices** the space needs to support and will the design support them with minimal reconfiguration and compromise? Is this obvious to the instructor? Are there elements of the design that may limit the use of some instructional practices?*

☐ *Have you thought enough about future change, particularly in terms of **flexibility and adaptability**? How will the space successfully evolve over time to support different instructional practices?*

5. Accessibility

Ensure that principles of accessibility are central to the design of all learning spaces, and that all participants have a common experience.

a. Comply with BC Building Code regarding the principles of accessibility, with additional design guidance in the BC Building Access Handbook. New space will meet or exceed these requirements, and renovated space will be brought to as high a level of accessibility as practical. Also refer to other sections in this document:

- Accessible seating considerations as per Section 4.5.1 (f. and g.)

- Signage considerations as per the UBC Interior Wayfinding Signage Guidelines.

- Acoustics considerations as per Section 4.9.

b. Provide clear and easily accessible routes to and from building entries, and into and throughout the learning space.

c. Ensure that instructor spaces are accessible to those using mobility aids.

d. Provide lighting, sound and equipment controls that are intuitive and easy to use.

Design checklist questions:

☐ *Will all students have the **same quality of learning experience** in the space, regardless of where they are sitting, or their abilities?*

☐ *Have you checked **sight lines** to ensure that all parts of the space are not blocked by columns, static AV equipment, ceiling attachments, or furniture?*

6. Location

Locate learning spaces to support effective building zoning, circulation and access.

a. Locate large learning spaces as close to the building entrance level, major stairs and elevators as possible in order to improve access, isolate class change noise and high traffic functions from office and lab functions, and provide opportunities for building security zoning. Large learning spaces in particular, should be located close together and close to primary building entrances and circulation spaces that are large enough to accommodate students waiting for the next class.

b. Cluster learning spaces (preferably on the ground floor) to enable opportunities for optimal thermal zoning, lighting zoning and application of energy efficiency strategies. This zoning will also assist in other considerations for security zoning and related safety of building occupants and equipment.

c. Learning spaces should generally be separated from research labs, hazardous material rooms and noise generating areas such as mechanical rooms, elevators, cafeterias, vending machine areas, and restrooms.

Design checklist questions:

☐ *Have you provided a range of **informal learning spaces** near the main theatres, classrooms and seminar rooms?*

☐ *Have you fully considered the pros and cons of **where the learning space is located** in the building and the implications for student traffic, noise, security and interaction?*

Section 3: Learning Space Types

3.1 INTRODUCTION

This section includes quick references that summarize information on the key attributes of the four basic types of learning spaces described in the LSDG:

1. **Theatre**
2. **Classroom**
3. **Seminar**
4. **Informal**

The above indicated four learning space types are described as discrete space types, however in practice there is a continuum of room types and attributes, and instructors often use all spaces in creative ways. Teaching laboratories are not included in the guidelines as they are typically specialized spaces that are assigned to a specific department, discipline, or program.

When reviewing Sections 3 and 4, the following should generally be considered:

a. **Accessible seating:** For Type 1 Theatre rooms, a minimum of 2 rows of seats to be accessible to wheelchair users and those with mobility aids, and wheelchair access to the room should be made available wherever there is a room entry level (e.g., front, back, middle).

b. **Area per seat ranges:** To reflect relative efficiencies that are expected in larger rooms of each learning space type, the area per seat ranges are included. The lowest nsm/seat applies to the largest seat capacity, and the highest nsm/seat applies to the smallest seat capacity. For example, a 75 seat Type 1 Theatre requires a minimum of 2.6 nsm (28 nsf) per seat, and a 200 seat Type 1 Theatre requires a minimum of 2.2 nsm (23.7 nsf).

c. **Video conference requirements:** Learning spaces intended for video conferencing or other distributed learning pedagogies have specific requirements to support these activities. Particular focus should be paid to the areas of acoustics and ambient noise, lighting, window coverings and material colour selection, all of which may have more stringent requirements than a regular learning space. More specific information can be obtained in Section 4 of this document and from the UBC Technical Guidelines. The Audio Visual Team should be consulted in all cases.

3.2   LEARNING SPACE TYPES

Type 1:

Theatre

The theatre is the most effective learning space type for lectures, presentations, demonstrations and media viewing for 75 to 500 people, as it provides the best opportunities for good sightlines for each person to the front of the room. Design for active learning opportunities, such as a blend of lectures and break-out/small group, class discussion/debate, or small group project work.

1. Tiered, oriented to front-of-room instructor area.

2. Multiple lighting zones as defined in Section 4.7.2.

3. Sufficient table space to support a range of student activities.

4. Multiple instructor area marker boards and projection screens.

5. Power at 100% of seats.

6. Seat capacities and area per seat:

    - 75 to 200 seats: 2.6 to 2.2 nsm (28 to 23.7 nsf) per seat.

    - 201 to 500 seats: 2.2 to 2.0 nsm (23.7 to 20 nsf) per seat.

7. Floor rake:

    - 75 to 200 seats rooms may have a shallower floor-rake with stairs and/or, ramps if practical.

    - 201 to 500 seats rooms require steeper floor rakes with stairs and/or, ramps if practical.

8. 201 to 500 seat rooms typically have additional attributes including:

    a. Wide spans and high ceilings/multi-storey height in order to accommodate sightlines and acoustical requirements.

    b. Additional up and cross aisles to support the movement of instructors.

    c. Special acoustic design requirements including wall and ceiling treatments and sound reinforcement for instructors.

    d. Additional room controls for window coverings, AV equipment, and communications between students and instructors.

    e. Up to 2 tiers of 3 sliding marker boards (top tier is typically covered when dual projection screens are lowered).

9. Active Learning theatres may have different seating row configurations:

    a. Active learning: 2 rows of fixed tables and moveable seats per tier.

    b. Case-style: 1 row of fixed tables and moveable seats per tier. Any student can face approximately 2/3 of all other students, and instructor can be close to all students without leaving instructor area.

    c. Collaborative: 1-2 rows per very deep tier, with small moveable meeting tables.

Example, moveable small group tables and chairs: UBC HENN 200, 180 seats

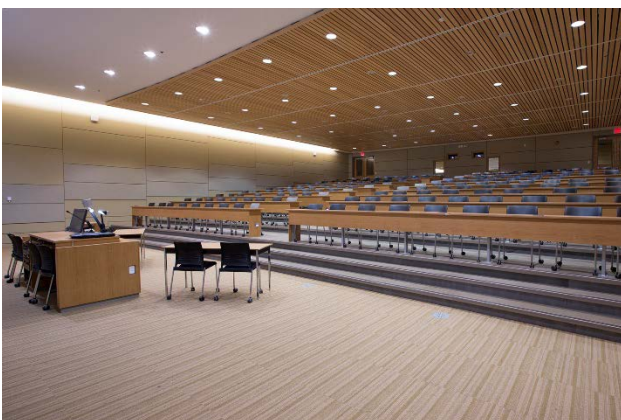*Example, fixed bench, fixed seating: UBC HEBB 100 375 seats*

Example, fixed bench, fixed swivel chairs: UBC LASR 102, 80 seats

Example, case-style, fixed bench, moveable chairs: UBC IONA 301, 100 seats

Example, fixed bench, moveable chairs: UBCO EME 0050, 200 seats

Example, 2 rows/tiers, fixed bench, moveable chairs and fixed tablet chairs: UBC ESB 1012, 150 seats

Type 2:	**The classroom is the most common learning space type at UBC. The classroom is most effective for 30 to 120 people, with variations that include front of room scheduled instruction, lectures, media viewing and small group work, scheduled and/or drop-in small group active learning, student use of technology, and student and instructor interaction.**

Type 2: Classroom

1. Flat floor, for 30 to 120 people.

2. Fixed or movable layout and furniture depending on instructor activities.

3. Multiple lighting zones as defined in Section 4.7.2.

4. Ceiling height to suit room size and required video display sizes, as outlined in Section 4.2.4.

5. Power outlets in floor or, preferably, power to desks where requested. Minimum of 50% of seats provided with power if movable tables, and 100% of seats if fixed tables.

7. Area per seat: 2.8 to 2.3 nsm (30 to 25 nsf).

8. Moveable chairs and fixed or movable tables, or moveable tablet chairs. Moveable tables must be easily and quickly moveable so they can be easily clustered in groups or oriented to front of room instructor area.

9. Multiple marker boards. Surrounding marker boards may act as public thinking spaces.

10. Variations may have no front of room instructor area. Typically, the instructor station can be located anywhere in the room, but if they have AV equipment or computers, they will have a fixed location. Additional instructor station capabilities may include the ability to view their laptop material at any table and project the material to the whole class.

11. Student tables may be in groups of 4 to 6 seats. Each group may have access to its own marker board.

12. Special acoustic design requirements including wall and ceiling treatments and sound reinforcement for instructors (if applicable).

13. In high-tech rooms, every table is provided with AV/IT attributes. Depending on the design, these may include marker board, projector and projection surface, large wall monitor, power at each seat, and may require fixed furniture or additional conduit infrastructure.

Example: UBC UCLL 107, 48 Seats

Example: UBC ORCH 3018, 48 Seats

Example: UBC UCLL 101,30 Seats

Example: UBC UCLL 109, 30 Seats

Example: UBCO EME 2181, 50 seats

Example: UBC DLAM 009, 66 seats

| **Type 3:** | **The seminar room is the most effective learning space type for small group discussions, meetings and collaboration for 8 to 40 people.** |
| **Seminar Room** | |

1. Flat floor.

2. Seat capacities and area per seat:

    a. 8 to 16 seats: 2.5 to 2.2 nsm (27 to 23.7 nsf) per seat.
    b. 16 to 40 seats: 2.9 to 2.5 nsm (31.2 to 21.5 nsf) per seat.

3. One wall has a projection screen or large monitor.

4. Face-to-face seating arrangement so that students and instructors can easily interact with each other.

5. Movable tables and chairs optimized for group discussion. Hollow-square/ horseshoe table configuration for large group and central table for small group.

6. Multiple walls with marker boards.

7. Minimum of 50% of seats provided with power. Power outlets in floor and walls for larger rooms, and walls only for smaller rooms.

8. Lighting zone(s) as defined in Section 4.7.2.

Example: UBC PCOH 1011, 24 seats

Example: UBC BUCH B216, 22 seats

| **Type 4:** | The informal learning space (ILS) is the most effective learning space for unscheduled and informal learning and meetings between students, and between students and instructors outside of Type 1, 2, 3 spaces. |
| **Informal Learning Space (ILS)** | |

The informal learning space (ILS) is the most effective learning space for unscheduled and informal learning and meetings between students, and between students and instructors outside of Type 1, 2, 3 spaces.

1. Meaningful space that appears purposeful and well-considered. ILS design should be deliberate and attractive, and as seriously considered as all learning spaces – it should not be an afterthought. ILS occupants should feel welcome and valued. Design to reflect the intended purpose:

   ▪ Quiet study.
   ▪ Individual study or work.
   ▪ Group study.
   ▪ Collaborative/group work.
   ▪ Tech enabled variations of the above.
   ▪ Socializing, eating, or waiting for classes.

2. Furniture design and selection to support intended activities with fixed tables, bench seating, and soft seats. This type of furniture is generally preferred to minimize the need for operational staff management. Moveable chairs are generally preferred for reasons of ergonomics and flexibility.

   a. Distinctions to be made between common/circulation and actively managed spaces (e.g. library space).

   b. Comfortable and adequately sized and dimensioned furniture is essential to support full and efficient usage (e.g. a table intended for four students should be useable/in use by four students).

3. ILS supports simultaneous accommodation of multiple learning activities through provision of a variety of furnishings, aesthetics, privacy levels, and group/individual choices.

   a. Opportunities for both individual study, and more social group learning.

   b. Secure and safe environment.

   c. Varying environments that are conducive to the intended activities, including consideration for access to natural lighting, comfortable artificial lighting, and acoustic controls.

4. ILS may be an open or enclosed area depending on the intended purpose, and location and capacity:

   a. **High-capacity central ILS:** Typically supports 30 to 100 people. (e.g., student lounges, common areas, etc.) This space is typically in a high profile location such as near a main entrance or circulation hub.

   b. **Low-capacity distributed type ILS:** Typically supports 2 to 30 people. Some locations include outside of theatres and classrooms, in corridors, and transition spaces between adjoining buildings.

   c. **Café seating ILS:** Typically supports 30 to 45 people and located with a food service. This space is typically in a high profile location such as near a main entrance or circulation hub. Although cafés are considered informal spaces, design requirements for cafés are determined by UBC Food Services.

5. Lighting suitable for study is required.

6. Consistent and high capacity Wi-Fi is required in all ILS areas.

7. Power should be accessible at each seat, located in floors, walls or furniture depending on seat configuration. Avoid locating plugs where they will create a tripping hazard.

8. Seating typically includes a mix of fixed and moveable tables and chairs, depending on the context and purpose. Appropriate ergonomic seats and work surfaces are required.

9. ILS is typically open when the building in which it is located is open.

10. All ILS design elements to reflect principles of universal design.

11. Locate ILS:

   a. In building circulation areas (e.g. foyers, atria, alcoves, corridors) to support casual and planned meetings and discussions.

   b. Where it will be most used (e.g. buildings with other learning space types, near to food or vending locations and high-traffic zones).

   c. On the ground floor adjacent to a major entry so that it remains open after hours while the rest of the building is capable of being secured.

   d. To ensure that it is easily found and identifiable as accessible to all.

12. Provide direct access between inside and outside ILS, where appropriate and practical (e.g. use of operable sliding glass panel/garage doors).[1]

13. Hallways, corridors, and connectors to provide essential, thoughtful and valuable ILS. Key interior design guidelines for corridors and alcoves as ILS include:

   a. Inviting colours and patterns in durable, non-skid floor coverings as a means to define the areas.

   b. Privacy in some areas, and opportunities for social interaction in others.

   c. Include short term seating in any crush space included with theatres.

   d. Acoustic controls.

   e. Suitable space and locations for waste and recycling containers.

14. Key ILS metrics include:

   a. 3 to 5 nsm (32 to 54 nsf) per seat as a rule of thumb for ILS.

   b. Minimum ILS equal to 12% of all teaching space in the building[2] and a goal of 14 to 16% where practical.

   c. ILS to be developed as a mix of centralized and decentralized, with an approximate ratio of 65% to 70% centralized and 35 to 30% distributed.

15. Incorporate AV such as flat panel displays where appropriate.

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[1] *As the public realm program unfolds at UBC, under the guidance of the UBC University Architect, there may be additional guidelines for ILS outdoor areas.*

[2] *For this metric, "teaching space" equals the sum of categories 1.0 Classroom Facilities and 2.0 Laboratory – Undergraduate space, excluding support space sub-categories, as defined in the "B.C. Universities Space Manual".*

Example, alcove ILS: UBC PCOH Ground Floor

Example, study Area ILS: UBC ESB Ground Floor

Example, classroom/corridor waiting ILS:
UBC BUCH A 2nd Floor

Example, café ILS: UBC BUCH A 1st Floor

Example, large alcove ILS: UBC BUCH B

Example, stairs ILS: UBC ORCH

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Section 4:
General Guidelines for Learning Space Type 1, 2, 3

4.1 STEPS, RAMPS, ACCESSIBLE ELEVATORS & AISLES

4.1.1

Accessible Elevators

1. Wheelchair lift and elevator access considerations to meet or exceed Building Code requirements. Notwithstanding this requirement, key considerations include:

   a. Where required, a ramp is generally preferred over a wheelchair lift. In any case, access to the front of the room is a minimal requirement and access to the front, back and mid-point of the room is preferred.

   b. Where a stairway wheelchair lift is required in order to access a learning space, the staircase width is to be a minimum of 1100 mm (43") wide.

   c. Wheelchair lifts should be visible, easily accessible and unlocked.

4.1.2

Steps & Ramps

1. Provide a direct route for wheelchair users and people with mobility impairments to get to the accessible seating areas of the room. The preferred ramp slope is 1:20, although 1:12 is permitted with appropriate landings.

2. Where practical, shallower tiers are preferred in theatres to facilitate instructor movement and accessibility.

3. Stair nosings are highlighted with a minimum of 38 mm (1.5") to a maximum of 50 mm (2") high-contrast photo-luminescent strip for the full width of the step tread and extending down the face of the nosing for 38 mm (1.5") to 50 mm (2").

4. Provide stair lights integrated into seating or risers. Lights should have daylight sensors and should not be tied into the Emergency Lighting system. LED lights are preferred for longevity.

5. Steps and ramps to be a minimum of 1100 mm (43") wide.

4.1.3
Aisles

1. For up and cross circulation aisles, the number and location of these aisles should support instructors moving throughout the student seating area. Ideally, these aisles should support instructors walking to within 6 seats of any student.

2. Up and cross circulation aisles to be a minimum of 1100 mm (43") wide.

3. Provide a minimum of 914 to 1066 mm (36" to 42") circulation/chair space for each row of tables (table to table).

4.2   ROOM SIZE CONSIDERATIONS & SIGHTLINES

4.2.1
Room Aspect Ratio

1. Room aspect ratio (width to depth) and height requirements are a function of several variables:

    a. Room seating capacity.

    b. Furniture and furniture layout.

    c. Up and cross aisle locations.

    d. Sizes and locations of projection screens/monitors.

    e. Importance of instructors' and students' ability to make eye contact and hear each other.

4.2.2
Projection & Projection Booths

1. Determine the number, size, and location of the projection screens/displays based on pedagogical requirements, sightline considerations and overall room size, height and type.

2. The maximum ratio of the distance from the projection screen/display to the most distant viewer is 6x screen height. Dual display video conferencing systems should have the most distant viewer at 6x screen height. Single display video conferencing systems should have the most distant viewer at 4x screen height.

3. Large Type 1 Theatres should have an enclosed projection booth to house projectors and equipment racks. These rooms should be accessible from the entry vestibule or foyer outside the room wherever possible. These rooms should be located at the rear of theatres, centred opposite the projection screens. Windows should be positioned no higher than the top of projection screens, in such a way that people standing in the rear row of the theatre do not interfere with the projection path, or have the opportunity to receive projection light in their eyes. Window glass should be meant for projection, with angled glazing and optical grade, anti-reflective glass.

4. Consideration should be taken in the construction of projection booths to minimize spurious vibrations from HVAC systems, opening/closing doors, or other building vibrations. Adequate cooling systems must be provided as appropriate for day to day operating heat gain of all enclosed equipment.

5. Placement of AV equipment racks must be considered in the design and layout of projection booths, including adequate space around said racks for service activities.

4.2.3 Equipment Racks

1. Most AV systems will require space for at least one rack of AV equipment. In instances where space is not already planned for a projection booth or lectern, additional space may be required. This additional space may be in the form of an adjacent or nearby room or closet, or within in-room millwork. Specific size requirements and cooling requirements will be dependent on the AV system design, and in all cases the Audio Visual Team should be consulted to ensure appropriate size and location.

4.2.4 Sightlines

General

1. Base design on the functional, pedagogical, and learning activities expected to take place in the room.

2. Balance the conflicting objectives of wider, shallower rooms (that make it easier to be closer to the audience in the most distant seats but may require more video screens to accommodate viewers) with longer, deeper rooms (that require a higher finished ceiling height to accommodate screens of appropriate size for most distant viewers.) Both extremely wide and extremely long rooms should be avoided. Irregularly-shaped rooms should also be avoided.

3. Ensure there are no sightline obstructions (e.g. columns) between seats and projection screens/displays and marker boards in new construction. In renew and smaller renovation projects, minimize the impact of existing obstructions.

4. The room will be designed to allow for an uninterrupted projection path from the mounted projector location to the screen locations. This includes any suspended light fixtures or other ceiling fixtures. For the purposes of determining projection sight lines, "finished ceiling height" shall be defined as the height of the lowest fixture suspended from the ceiling.

5. Ensure that, from the front of the room, instructors are able to make eye contact with all students.

6. Ceiling height is primarily a function of requirements for projection screen/display plus marker board heights. Projection screens/displays are typically available in fixed sizes and proportions.

Horizontal Viewing Angle

1. The maximum off-axis horizontal viewing angle from the centre of a projection screen/display with a 16x10 aspect ratio is +/- 42 degrees (preferred) to 45 degrees (maximum), resulting in an 84 degrees (preferred) to 90 degrees (maximum) side-to-side cone.

2. Locate the front row of seating no closer than 1.5 times the projection screen/display height

3. In large rooms, where there are two or more projection screens with different images, it may be necessary to angle the screens toward the centre of the room to ensure both screens can be viewed with equal legibility and the seats are within required viewing angles.

Vertical Viewing Angle

1. The nominal vertical viewing angle for the audience will be 30 degrees from eye level to the top of the screen.

2. Screens will be placed high enough to allow viewing by students seated in the back of the room. The bottom of the screen should be at least 1220 mm (48") above the floor for Type 2 Classrooms.

3. For large Type 1 Theatres, the lower edge of the screens/displays should not cover marker boards.

4. In all cases, overall ceiling height should be planned to accommodate stated guidelines and minimum distance to bottom edge of screens.

5. Ceiling heights in all cases should be a minimum of 2440 mm (8').

6. Common display/screen sizes and minimum ceiling heights are as follows (based on *Design Guidelines, U of California Santa Cruz, Mar 2015*):

Distance to last row of seats	Minimum display/screen size (16:9/16:10 aspect ratio)	Minimum ceiling height
4.570m (15ft)	60" Flat Panel Display	2440mm (8')
6.096m (20ft)	80" Flat Panel Display	2440mm (8')
7.620m (25ft)	2030mm W x 1270mm H (80" W x 50" H)	2690mm (8' 10")
9.144m (30ft)	2440mm W x 1520mm H (96" W x 60" H)	2940mm (9' 8")
10.668m (35ft)	2790mm W x 1750mm H (110" W x 69" H)	3170mm (10' 5")
12.192m (40ft)	3530mm W x 2210mm H (139" W x 87" H)	3630mm (11' 11")
13.716m (45ft)[1]	3530mm W x 2210mm H (139" W x 87" H)	4544mm (14' 11")
15.240m (50ft)[1]	4060mm W x 2540mm H (160" W x 100" H)	4874mm (16')
16.764m (55ft)[1]	4470mm W x 2790mm H (176" W x 110" H)	5124mm (16' 10")
18.288m (60ft)[1]	4775mm W x 2985mm H (188" W x 117.5" H)	5319mm (17' 5")
21.384m (70ft)[1]	5690mm W x 3556mm H (224" W x 140" H)	5890mm (19' 4")
24.384m (80ft)[1]	6500mm W x 4064mm H (256" W x 160" H)	6398mm (21')

[1]*Assumption that distance greater or equal to 13.716m (45ft) will be a Type 1 Theatre and minimum ceiling height must allow for marker board to be completely uncovered by the screen.*

4.2.5 Instructor Area

1. Orient the lectern to allow instructors to maintain eye contact with all students. Lectern should not block sightlines to marker boards and projection screens/displays.

2. Lectern likely to be fixed for Type 1 Theatres and mobile for Type 2 Classrooms and Type 3 Seminar Rooms.

3. Provide sufficient space at the front of the room for wheelchair circulation around the lectern.

4. In Type 1 Theatres and Type 2 Classrooms, provide sufficient space at the front of the room for an instructor table of 610 mm x 1524 mm (24" x 60") and two chairs.

4.3   DOORS & WINDOWS

4.3.1 Doors

1. Locate learning space doors to minimize congestion in hallways, to minimize disruption and to provide easy circulation flow and egress. Rear entry doors are generally preferred to minimize disruption by latecomers.

2. Vision panels or side lights:

   a. Provide either a glass vision panel in door between enclosed learning spaces and adjacent hallways, or a side light immediately adjacent to the door.

   b. Ensure vision panel or side light glass is tempered.

   c. Ensure vision panel provides adequate privacy via the use of film and/or fretted glass, while providing sufficient views in and out of the room for safety. Film to be plain or have a simple pattern.

3. Equip Type 1 Theatre rooms with automatic door openers to all entrances that lead to accessible seating areas.

4.3.2 Windows

1. Exterior windows with sufficient views to see the weather and provide a sense of the "outside" are preferred.

2. The climates of Vancouver and Kelowna are different and these differences must be taken into consideration. Learning spaces should have operable windows where possible. Where windows are operable on the UBC-O campus, they will be provided with screens and an automatic closing or open notification system.

3. Equip exterior windows with window coverings. Type 1 Theatre rooms require motorized window coverings; Type 2 Classrooms require

consultation with the Audio Visual Team to determine whether window coverings to be motorized or manual.

4. Window coverings should have 5% opacity for north-facing windows and 2% opacity for all other windows. Video conference equipped rooms require a full blackout blind with edge guides.

5. Locate exterior windows as follows:

    a. To prevent direct sunlight or reflected light on to projection screens/displays, video recording equipment and marker boards.

    b. To prevent glare and relative visual discomfort of occupants.

6. For video conference equipped learning spaces, orient room in such a way that windows are not located opposite main video screens. Consider positioning video conference rooms on the north orientation of the building to reduce natural light considerations.

4.4   FINISHES

4.4.1
Walls

1. UBC acoustically insulates all learning space walls. Seal all exterior wall penetrations and wall elements to achieve required acoustic ratings.

2. Folding, moveable or demountable walls are only acceptable with the approval of the Planning Team.

3. Apply chair rails on all non-masonry back and side walls in rooms with moveable furniture.

4. Wall finishes will not generally include high-contrast repetitious patterns, such as narrow horizontal or vertical slats, as they can be problematic for video-conferencing and/or for room occupants.

5. Accent colours in rooms to be considered, to enhance the ambience. Any wall colours within the room to be coordinated with furnishings and flooring.

6. For videoconferencing/AV-capture-enabled rooms, provide the lectern and other items within the field of a video camera with matte finishes that are free of polished metal surfaces as the latter in particular may produce video "hot spots" and may cause video camera iris closure.

7. For videoconferencing/AV-capture-enabled rooms, wall finishes should not exceed 40 to 60 percent reflectance. Use neutral colours such as greys, blues, and mauves. Avoid highly reflective colours such as black, orange, yellow, green, or red. Brightly lit pure-white surfaces will be avoided to ensure that the instructor or student is imaged appropriately by the camera and to reduce light reflections when data projectors are in use.

4.4.2
Ceilings

1. Ceiling finishes to be matte, light in colour and sound absorbing. Preference is given to acoustic tiles or other easily removable and serviceable finishes.

2. Ceiling space to be easily accessible for servicing and maintenance of lighting, learning technology, finishes and other ceiling systems. Avoid use of materials such as wood, finished drywall, or otherwise difficult to open and service systems. Avoid use of custom or difficult to replace ceiling tiles.

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4.4.3

Floors
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1. Floor colour to be coordinated with walls and furniture.

2. Floor covering choices include carpet tile or resilient flooring. Where carpet tile is used, it should be multi-coloured or patterned rather than a solid colour, and dark colours should be avoided. In rooms intended for video conferencing or video capture, more neutral and non-reflective carpeting colours should be chosen.

3. Floor coverings must be considered for their acoustic properties to ensure they are appropriate for the space.

4. Consider use of colour and/or flooring materials to delineate up and cross aisles.
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4.5   FURNISHINGS

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4.5.1

Chairs
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1. Specify durable materials for long-term institutional use, with a minimum standard 10-year written manufacturer's warranty.

2. All learning spaces should offer a choice of seating with and without armrests. Typically the ratio is 50:50 to offer choice for students.

3. Where applicable, provide 15% left handed tablets.

4. A selection of moveable seats acceptable in UBC learning spaces are illustrated below:
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Sled base, stackable	**4 legs with casters**	**Height adjustable, swivel, pedestal base**
Most economical choice.	Typical for most learning spaces, allows for flexibility.	Used to maximize student interaction. 27" clearance needed.

5. A key principle is to provide seating choices to students with accessibility requirements. As a result, accessible seats will be located at each row that is adjacent to a room entry (e.g., front, back, middle of room). A minimum of one front row will be accessible.

6. Bariatric seating to be provided on as-needed basis, integrated with other accessible seating.

4.5.2

Student Tables

General

1. Tables to comply with UBC standards. Departments that require different tables or table configurations will seek UBC approval and may be responsible for replacement costs.

2. Width per seat: 760 mm (30") minimum.

3. Table corners to be rounded. "Knife" edges to be avoided.

4. Table top should not be a solid colour. Choose PLAM that hides marking.

5. All Type 1 Theatres and Type 2 Classrooms should have some standing height or, preferably, height adjustable tables.

6. Accessible tables to be height adjustable where practical, particularly for Type 1 Theatres. Where height adjustable table and counter tops are not practical, the table top should be from 760 mm to 865 mm (30" to 34") above the finished floor.

7. Power operated wheelchair users require higher knee clearance and counter services, therefore height-adjustable tables are recommended.

Fixed Tables

1. Fixed student table design to ensure that knees do not bump up against table legs, power outlets, etc., under the table.

2. Ensure that fixed student table surfaces are cantilevered to minimize the number of legs and optimize opportunities for flexible movement of seats

3. Ensure all fixed table or millwork systems include discrete and accessible pathways for electrical, network, and AV cabling.

4. For Type 1 Theatres, fixed student tables width and depth as follows:

   One row per tier:

   - *Width per seat: 760 mm (30") minimum*
   - *Depth: 457 mm (18") minimum to 508 mm (20") preferred.*

   Two rows per tier

   - *Width per seat: 760 mm (30") minimum*
   - *Depth: 711 mm (28") minimum for second row.*

5. For Type 1 Theatres with two rows per tier, provide a front modesty panel at the first row of student tables, with the lower edge of the panel placed high enough above the floor so that feet will not kick it and result in damage. Consideration needs to be given to the material (acoustics, reflectiveness, vibration).

6. For Type 1 Theatres with fixed tables, rows require unique identifiers at ends.

Moveable Tables

1. Moveable student tables are used in most Type 2 Classrooms and Type 3 Seminar rooms:

    ▪ *Width per seat: 760 mm (30") minimum*
    ▪ *Depth: 457 mm (18") minimum to 508 mm (20") preferred.*

2. A selection of moveable tables acceptable in UBC learning spaces are illustrated below:

T-Leg

4 legs

Power at Tables

1. Provide access to power at student tables as follows:

    a. Type 1 Theatres: 100% of all seats provided with power as practical.

    b. Type 2 Classrooms and Type 3 Seminar rooms: Minimum of 50% of all seats provided with power as practical.

    c. Type 4 Informal Learning Space: Provide as many seats with power as practical, with a goal of 100% of seats provided with power.

2. All power points to be accessible without power cords or other tripping hazards.

3. Any floor power boxes must be durable, ground fault, flush with the floor, and appropriately sized for the services required at that location.

4. Any room designated to also support online examinations requires power at 100% of seats.

4.6   ROOM EQUIPMENT

4.6.1 Marker Boards

1. Marker board is used as a generic term in this document for white boards, chalk boards, glass boards or other wall writing surfaces.

2. Marker boards will be porcelain on enamel. Chalk rails will be specified and installed for each marker board.

3. Locate marker boards on all walls where practical. The bottom of the marker board should be 914 mm (36") above the floor.

4. Locate marker boards so they can be used simultaneously with the projection screens/display. This is often in conflict with AV and requires careful consideration to find a balance.

4.6.2 Voice Amplification

1. In rooms with 50 seats or fewer, amplification of the instructor's voice is optional. In rooms with more than 50 seats, amplification of the instructor's voice is required.

2. Student seats will not generally be provided with microphones. In exceptions where microphones are required, there will be one microphone per two seats.

3. Audio connections for assistive listening systems should be provided in all rooms with 100 seats or more. Assistive listening specific equipment will be provided on an as needed basis.

4.6.3 Lectern

1. For rooms of 50 seats or more, provide one standard UBC instructor lectern of the appropriate size. For rooms of fewer than 50 seats, consult the Planning Team. All Type 1 Theatres and Type 2 Classrooms will have an instructor table and chair.

2. Lighting, screen and room controls to be easily accessible from a wall panel and/or the lectern.

3. Provide a minimum of one data port in the lectern for Type 1 Theatres and at the centre of the front wall for Type 2 Classrooms and Type 3 Seminar rooms.

4. Lecterns require at least two user accessible power points. An additional power circuit should be provided at all AV rack locations. User power points and AV equipment power points will always be on separate circuits.

5. The fixed lectern position in Type 1 Theatres requires appropriate conduit capacity between the AV projection booth or AV equipment closet to accommodate all required AV system connections. A minimum of 2 extra empty conduits with pull strings should be provided for future expansion. During AV system installation, additional cabling should be pre-installed for future expansion.

4.6.4 Signage

1. See UBC Interior Wayfinding Signage Guidelines for descriptions, policy statements, metrics and graphics for room exterior and room interior signs.

4.6.5 Clocks

1. Provide a UBC-approved clock in each enclosed learning space and in larger informal learning spaces.

2. Locate clock on the side wall at the end of the first or second row, so it is easily seen by the instructor and students.

3. Large rooms may require more than one clock.

4. Dual sided clocks are not permitted as they do not offer good sightlines. Clocks should be affixed flat to the wall.

4.6.6
Video Cameras

1. In rooms where video cameras are required, the design team will need to make allowances for the successful incorporation of cameras in these rooms, including the following:

   a. Ambient light control from exterior windows is a critical issue. A room without windows is optimal for use with a video camera. Any windows will need a full blackout blind with edge guides.

   b. Optimization of artificial lighting is also a critical issue. The camera sees the participant faces, the table, rear wall and ceiling and as such the maximum-to-minimum luminance ratio for each surface should be kept low to ensure optimum image pickup. The rear wall behind participants should be illuminated with wall wash fixtures to provide contrast and depth to the image.

   c. The finishes in the camera field of view will be optimized to avoid glare, moiré patterns, and lighting or contrast issues. Metal finishes will be matte and not polished. Paint finishes should be matte and should be optimized to provide good contrast for the instructors. White finishes should be avoided as they create problems with the iris opening of the video camera.

   d. Lighting fixture type and placement will also be critically important. Fixtures will be selected to eliminate hot spots in the camera's field of view.

   e. Camera placement and field of view are critical elements in making these rooms successful. Camera placement will be a priority in the design process. The cameras may need to be wall or ceiling mounted, depending on the ceiling height. In learning spaces with projection booths, if the camera is mounted in the booth, it will need to be behind anti-reflection coated glass, like the projector port glass.

   f. Video conferencing room cameras typically have a maximum horizontal viewing angle of 70 degrees. The camera is typically positioned below a single display or between dual displays. In all cases, the camera should be positioned roughly at eye level with a head on shot of meeting participants, and angled camera shots should be avoided. The objective of camera placement will always be to as closely simulate an in-person, eye to eye conversation as possible. The room should be designed in such a way that the camera does not directly face a window, to avoid silhouetting meeting participants.

4.6.7
Confidence Monitors

1. The confidence monitor is a video monitor or an additional screen facing the instructor/presenter, intended to provide easy viewing of the content that is on the main screen, far end sites in a video conference, or self-view of the camera shot during recording. They are required in videoconferencing/AV-capture-enabled rooms, and frequently for Type 1 Theatres. The design team will need to make allowances for the successful incorporation of confidence monitors in these rooms, including the following:

   a. The flat panel displays for these monitors will need to be large enough to provide good viewing for the instructor.

b. In smaller rooms, flat screen confidence monitors may be required along the rear wall in line of sight of the instructor standing at the lectern. They may be wall-mounted or ceiling-hung at that location.

c. In larger rooms, the flat screen confidence monitors may be required in the millwork of the front row of fixed tables or in millwork in the tables near eye-level where the seating tiers are steeper.

d. Cabling conduits should be provided to all confidence monitor locations, including one spare, empty conduit with pull string. Confidence monitors should have a dedicated electrical circuit.

4.6.8 AV Power Requirements

1. All power outlets intended for AV system connections should be on separate circuits from user accessible power. At a minimum, the following devices/locations should have dedicated power circuits: projectors, projection screens, AV equipment racks, lecterns, and confidence monitors.

4.6.9 Phones

1. At UBC-O, all learning spaces must be equipped with a phone. The phone should be installed near the lectern and placement will be determined in consultation with Media and Classroom Services. Learning spaces at UBC-V do not require phones.

4.6.10 Wi-Fi

1. Access points for Wi-Fi will be determined in consultation with the Audio Visual Team.

4.7 LIGHTING

4.7.1 Controls

1. Consult the Audio Visual Team on lighting system selection. Crestron lighting products are required for learning spaces lighting control in all cases.

4.7.2 Zones

1. There are four general lighting zones which can be combined and or used individually to create a number of different lighting schemes in learning spaces, as follows:

a. **Zone 1:** Marker boards should have uniform lighting with sufficient illumination for legibility of writing from all seats. Switch these lamps

separately from the rest of the room. These may require division into left and right zones.

b. **Zone 2:** Front of the room should have uniform ambient lighting for the front of room instructor area with sufficient illumination to support visibility of instructor, other front of room participants, and anticipated demonstrations, without directing light onto the screen surface.

c. **Zone 3:** Front seating should have uniform ambient lighting for the front rows of seats with sufficient illumination to support reading, note-taking and visibility of seat occupants by the instructor and by other room occupants.

d. **Zone 4:** Back seating should have uniform ambient lighting for the back rows of seats with sufficient illumination to support reading, note-taking and visibility of seat occupants by the instructor and by other room occupants.

2. Determination of the required zones in any given room requires approval by the Audio Visual Team and is generally a function of room seat capacity and size, as follows:

a. Fewer than 75 seats: three zones.

b. Greater than 75 seats: four or more zones.

3. In learning spaces that have been designed with daylighting, zone the lighting system so that the lights in the naturally lit area can be dimmed or turned off when sufficient daylight is detected.

4. Consideration should be given to room orientation when planning lighting zones, and generally speaking light zones should be positioned from front of room to back, as opposed to side to side.

5. Avoid use of suspended or hanging light fixtures wherever possible. The lowest point of any item suspended from the ceiling shall be considered the finished ceiling height for the purposes of this document.

4.7.3 VC & Media Capture

1. Videoconference (VC)-specific lighting is required for VC-enabled rooms. This will include specific zoning, delineated coverage of specific areas and specific illumination levels, much higher than the lighting requirements for regular learning spaces. Participant faces and walls should have an appropriate illumination level for videoconference purposes.

2. The performance of VC or media capture-enabled learning space lighting is of key importance and may conflict with energy efficiency goals. Lighting in these rooms will also support regular light levels for conventional/non-VC uses.

3. Colour temperature (3500 degrees Kelvin) is required in large Type 1 Theatre rooms. Different lights/colour temperature will not be mixed.

4. The lighting dimmer system must be capable of easy and total integration with Crestron AV control systems.

5. A lighting analysis using an illumination engineering software must be provided for review by the Audio Visual Team.

6. The room lighting that falls on the projection screen surface will be separately switched.

7. Increased light levels may require more light fixtures or higher power, producing an elevated HVAC load. Select light fixtures with the highest luminous efficacy to reduce the impact on heat load.

4.7.4
Switches & Sensors

1. Provide labeled zone lighting diagram at each switch location. Zone label design will be approved by the Planning Team and the Audio Visual Team.

2. Locate light switches at each entrance to the room as well as at a location convenient to the instructor teaching area.

3. Duplicate light switches in the projection booth.

4. Orient light switch positions and labeling to the room orientation.

5. Provide vestibule light switch at each vestibule door.

6. Provide light switches at the end of each ramp inside and into learning spaces.

7. Where lighting controls are included in the AV system touch panel function, a basic wall-mount button panel to control lighting zones or pre-set selection should be included close to the instructor location.

8. Install programmable dual-technology sensors to automatically shut off the lights in the learning space and entry vestibule when vacant. Install a sufficient number of sensors in appropriate locations to detect occupancy throughout the room. Calibrate the sensor's sensitivity to the appropriate magnitude of motion and to avoid conditions that may result in false triggering.

4.7.5
Bulb Replacement

1. Fixtures to use lamps with uniform and appropriate colour temperatures (3500 to 4000K), which are readily available, recyclable, energy-efficient, long-lasting, and provide ease of maintenance (e.g., lamp replacement and fixture maintenance).

2. For Type 1 Theatres with high ceilings requiring scaffolding for light fixture maintenance or lamp replacement, ease of lamp replacement and fixture maintenance are of particular importance.

4.8 OPERATIONAL CONSIDERATIONS

4.8.1
Security of AV Equipment

1. AV equipment (e.g., computers, projectors, screens, DVD players, lecterns, etc.) will be fitted with security covers and tamper proof rack screws.

2. Projection room windows should utilize anti-reflection coating on projection windows, angled glass, and security bars.

3. Coordinate design with the Audio Visual Team to ensure that audiovisual equipment is appropriately secured.

4.8.2
Room Access

UBC-V

1. Operationally, all UBC-V learning space doors are kept unlocked, but must have the functionality to lock by way of a key and/or card access control programming.

2. In new construction, all learning space doors will have card readers.

3. The architectural hardware consultant will discuss proposed hardware with the Planning Team and provide cut sheets. Lock cylinder installation to be coordinated through Access Services and the Planning team. Typically, classrooms are keyed to a "KD" series sub-master key to limit the number of people who can lock/unlock the space.

UBC-O

1. Provide keyless SALTO systems access to all buildings with learning spaces, at the perimeter building doors including card readers built in to the structure.

2. All building exit/entrance doors must be connected to the central SALTO system to allow rapid lockdown of the entire campus in event of an emergency situation.

3. Major building entrances also need to be provided with a SALTO 'Hot Spot' for daily reset of key fobs and access cards.

4. Provide all internal doors with a SALTO lock so that they can only be locked or unlocked with a key fob kept by Campus Security or by persons authorized for those spaces.

5. All doors should be fitted for door closers.

6. Key fobs or access cards will be managed by UBC-O Campus Security. Facilities and IT will also have key fob access to all learning spaces as required.

Projection Rooms & Media Technology Rooms/Closets

1. Provide proximity card reader or approved lock that is programmable by the Planning Team and located on the wall adjacent to the door lever.

2. Provide mechanical key override with any mechanical locks installed in the doors to be deadbolt locks that are card-activated.

3. Provide electric strike (to allow key override when needed), door contacts, door closer, and security contacts wired to the security system.

4.8.3
HVAC & Mechanical Systems

1. Locate and route heating, ventilation, and air conditioning (HVAC) equipment away from rooms, particularly away from video-conference enabled rooms.

2. Design HVAC systems so there is minimal need to access the systems for maintenance via the learning space. Ideally, locate mechanical equipment needing routine service in a location outside the learning space to allow servicing without disrupting the class.

3. Provide above ceiling equipment with adequate access for servicing.

4. Mechanical systems will not be installed near projection booths to avoid vibrations of the projected image.

5. Pressurized water pipes should not be located directly above AV equipment or racks. If this is unavoidable, a water shield will be provided to protect the equipment from damage due to a pipe failure or leak.

4.8.4 Waste & Recycling

1. Locate waste and recycling stations according to the Recycling Infrastructure Guidelines for UBC Buildings.

4.9 ACOUSTICS CONSIDERATIONS

1. Refer to UBC Technical Guidelines Section 10 00 10 1.16 "Acoustical Design Standard for UBC Classrooms", for Acoustics Considerations.

Appendix A: Definitions of Terms

AV (AUDIO VISUAL) – Systems that communicate information to and from audiences by means of audio and/or video-supported technologies.

BUILDING SYSTEMS – All of the utilities and physical support systems and controls for the environmental support of all the elements of the facility, and the operational support of the delivery system, including mechanical, electrical, structural, plumbing, circulation, cladding, and interior finishing systems.

CAMERA ENABLED – Any learning space that is equipped with one or multiple permanently installed video cameras. These cameras may be used for multiple purposes depending on the requirements, including media capture, video conferencing, and overflow functionality.

CIRCULATION – The total system of connecting links that enable movement of people and materials throughout the facility, between rather than through departments; i.e., main corridors, elevators, stairs, etc.

CONFIDENCE MONITOR – A video monitor or an additional screen facing the instructor/presenter to mirror the content that the audience sees. The confidence monitor is intended to provide easy viewing of the content that is on the main screen, far end sites in a video conference, or self-view of the camera shot during recording.

CTL (CENTRE FOR TEACHING AND LEARNING) – Based out of the UBC Okanagan campus, CTL focuses on leading, supporting and promoting teaching and learning excellence, innovation and scholarship at UBC-O. CTL serves all facilities and schools at UBC-O, and provides support for graduate students/teaching assistants, post-doctoral fellows/scholars, and sessional/adjunct faculty.

CTLT (CENTRE FOR TEACHING, LEARNING AND TECHNOLOGY) – Based out of the UBC Vancouver campus, CTLT focuses on professional development in teaching and learning, integration of technology into teaching and learning, development and delivery of distance education courses and programs and other technology-enhanced learning opportunities and scholarly approaches to curriculum and pedagogy.

DISTRIBUTED LEARNING – Carries the implication that the class section is physically distributed or multi-site and that synchronous learning activities are going on (e.g., the UBC School of Medicine utilizes this model). Typically supported by some form of video conferencing.

EXIT – The means of egress that leads from the floor area it services, including any doorway leading directly from a floor area, to a public thoroughfare or to an approved open space.

FACILITIES PLANNING – Based out of the UBC Vancouver Campus, this is a group within UBC Infrastructure Development. They are UBC-V community's first point of contact for new buildings, renovations, relocations, and space adjustments. See SPACE PLANNING for UBC-O.

FT (FOOT/FEET) – An abbreviation for a unit of length.

HVAC – Heating, ventilation, and air conditioning system.

ILS – Informal Learning Space.

IT – Information Technology.

LEARNING SPACES TEAM – Based out of the UBC Vancouver campus, this is a team within Facilities Planning that is responsible for the day-to-day management of general use classrooms and provides input and direction for classrooms and informal spaces in renovation and new construction projects.

LECTURE CAPTURE – See MEDIA CAPTURE.

M (METRES) – An abbreviation for a unit of length.

MARKER BOARD – In this document, a marker board may be a white board, chalk board, smart board or any other vertical writing surface. In this document, marker boards are generally assumed to be wall mounted, but in practice may be portable.

MEDIA CAPTURE – Allows the recording of a video camera feed, audio, and presentation materials for later viewing and distribution.

MEDIA AND CLASSROOM SERVICES – Based out of the UBC-O campus, this is a group within IT, Media and Classroom Services that specialized in audio visual technologies. Provides both day-to-day support of AV systems in all equipped classrooms, as well as expert project management, programming, and installation services during all phases of planning and construction of AV enabled spaces. See UBC IT AUDIO VISUAL for UBC-V.

NSF (NET SQUARE FEET) – The total square footage of all the rooms/areas on a floor.

NSM (NET SQUARE METRES) – The horizontal area of space assignable to a specific function. The net areas of rooms are measured to the inside face of wall surfaces.

OVERFLOW – The ability to send audio and video feeds, including live camera feeds, from one classroom to one or more additional classrooms, typically within the same building and in close proximity to the host room. May operate as a one-way connection, or as a two-way connection to allow interaction between rooms.

STREAMING – Allows for a live broadcast of audio, video, and presentation materials from a host room. Typically operates primarily as a one-way connection, with the host site broadcasting to multiple receiving sites.

SPACE PLANNING – Based out of the UBC Okanagan campus, Space Planning is a group within Campus Planning and Development. They are UBC-O community's first point of contact for new buildings, renovations, relocations, and space adjustments. See FACILITIES PLANNING for UBC-V.

TYPE 1 THEATRE– Tiered, 75 to 500 seats, used most effectively for lectures and presentations.

TYPE 2 CLASSROOM – Flat floor, 40 to 120 seats, used most effectively for front of room instruction or small groups.

TYPE 3 SEMINAR – Flat floor, 8 to 40 seats, used most effectively for discussions.

TYPE 4 INFORMAL – Informal learning space (ILS) is where students spend time learning outside of Type 1, 2 and 3 learning spaces. ILS design features and area range considerably (e.g., from a found space on a grassy field, to a few square metres for a corridor bench outside a classroom, to hundreds of square metres for a centralized student commons).

UBC IT AUDIO VISUAL – Based out of the UBC Vancouver campus, this is a group within UBC IT that specializes in audio visual technologies. Provides both day-to-day support of AV systems in all equipped learning spaces, as well as expert project management, programming, and installation services during all phases of planning and construction of AV enabled spaces. See MEDIA AND CLASSROOM SERVICES for UBC-O.

UBC IT – Provides IT related strategy, applications, infrastructure, and support services to the UBC community.

UBC TECHNICAL GUIDELINES – Serve as the code of quality and performance for the design, construction and renovation of University-owned institutional buildings. This includes housing, athletics and institutional buildings, along with landscape and infrastructure; but excludes market housing whose maintenance is managed on a separate and different system. The UBC Technical Guidelines include performance objectives, technical requirements, and mandatory UBC-specific requirements for all campus buildings, recommended practices based on the experience of UBC professionals, project documentation requirements, UBC code-related issues, sample front-end documentation, plus steps to follow to expedite completion of UBC projects.

UNIVERSAL DESIGN – The design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.

VERTICAL CIRCULATION – The upward or downward movement of people and materials via elevators, stairs, etc., to connect with other floors within the building.

VIDEO CONFERENCING – Allows live, real time two-way communication between two or more geographically separated locations, including live camera and sound feeds, as well as transmission of presentation materials. Typically involves one or more larger groups/spaces with appropriate video conferencing equipment, and may also include individuals via desktop applications.

WEB CONFERENCING – Allows live, real time two-way communication between two or more geographically separated individuals, including live camera and sound feeds, as well as transmission of presentation materials. Differs from video conferencing as it is typically offered via personal computer or desktop applications as opposed to hardware equipment. Therefore it is suitable for individuals and small groups as opposed to larger groups or rooms.

Appendix B: Design Questions Checklist Summary

INTRODUCTION

In addition to the specific design guidelines in this document, a series of design questions were developed to assist both the design team and UBC during the design process. These questions are integrated in Section 2: Principles, and summarized below for reference.

DESIGN QUESTIONS CHECKLIST

1. Interaction

☐ Will the space layout and circulation support **instructor movement** throughout the space, and provide the instructor with opportunities to make easy eye contact with students?

☐ Will the space layout and furniture promote **collaborative, discussion based student work** with appropriate discussion aids?

2. Technology

☐ What types of **technology and media** are required to make this an effective space for learning and instruction? Has the room design considered sight lines to displays and instructor, and does it allow for future growth of technology systems? How does your design support capturing the products of learning and have you considered if the room needs to support video-conference or distributed education?

☐ Have you fully considered the location, design and required number of **power sources**?

3. Environment

☐ How have you '**future proofed'** the design towards making it operationally sustainable in terms of cleaning, maintenance, waste disposal, light bulb replacement?

☐ **Colour, materials, light, acoustics, ambient noise,** and **temperature** can have an effect on the user's learning experience and well-being – have you fully considered these factors? How have you made these features in your design conducive to learning?

4. Flexibility

☐ Are you clearly aware of what **instructional practices** the space needs to support and **will** the design support them with minimal reconfiguration and compromise? Is this obvious to the instructor? Are there elements of the design that may limit the use of some instructional practices?

☐ Have you thought enough about future change, particularly in terms of **flexibility and adaptability**? How will the space successfully evolve over time to support different instructional practices?

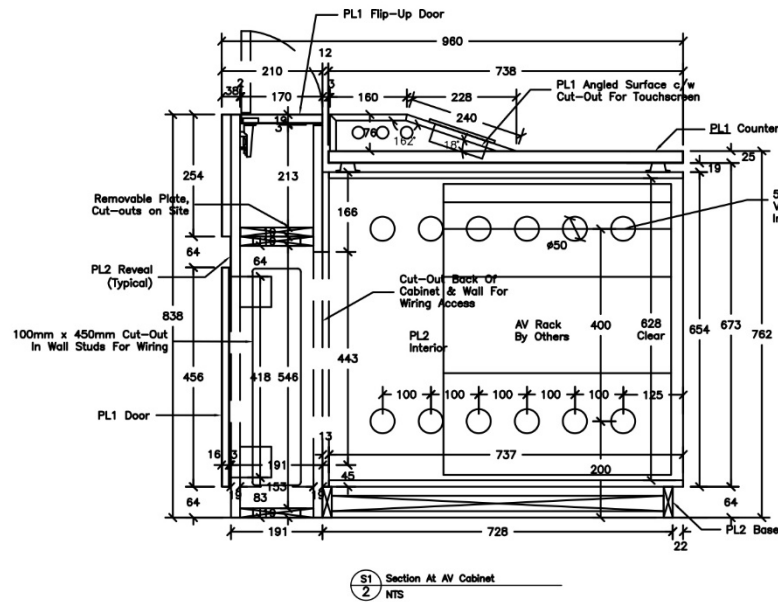| **5.** **Accessibility**	☐ Will all students have the **same quality of learning experience** in the space, regardless of where they are sitting or their abilities?
	☐ Have you checked **sight lines** to ensure that all parts of the space are not blocked by columns, static AV equipment, ceiling attachments, or furniture?
6. **Location**	☐ Have you provided a range of informal **learning spaces** near the main theatres, classrooms and seminar rooms?
	☐ Have you fully considered the pros and cons of **where the learning space is located** in the building and the implications for student traffic, noise, security and interaction?

Appendix C: Lectern Diagrams

SINGLE BAY SMALL LECTERN

SINGLE BAY SMALL LECTERN

S1 Section At AV Cabinet — NTS

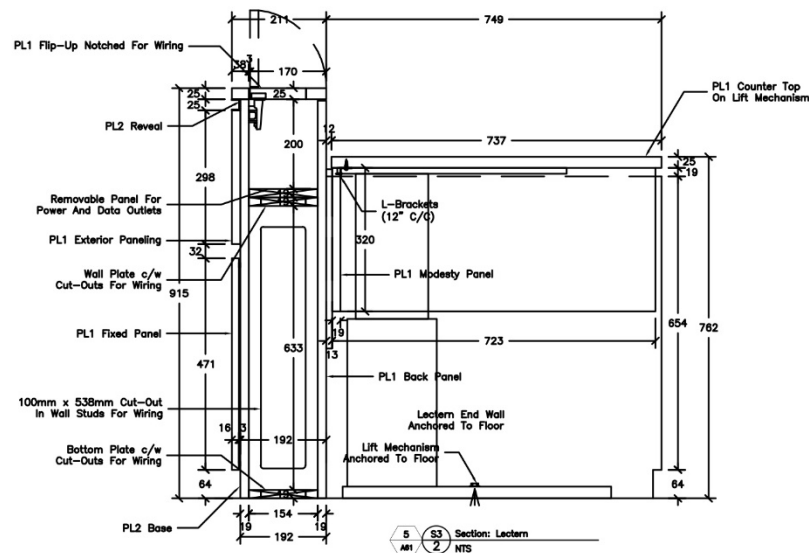S2 Section At Counter Top — NTS

S3 Section At End Wall — NTS
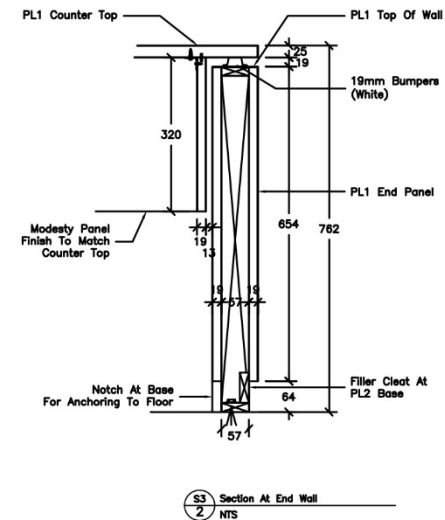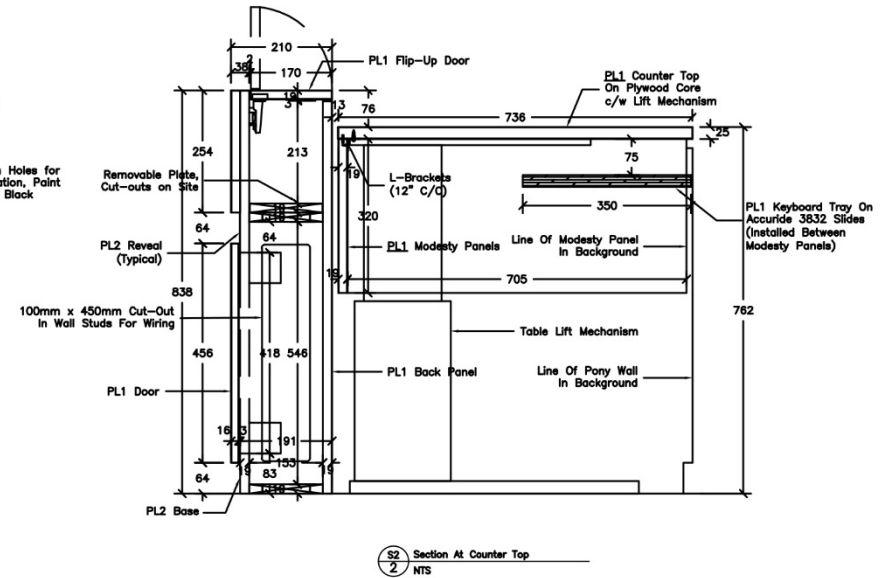
SINGLE BAY LARGE LECTERN
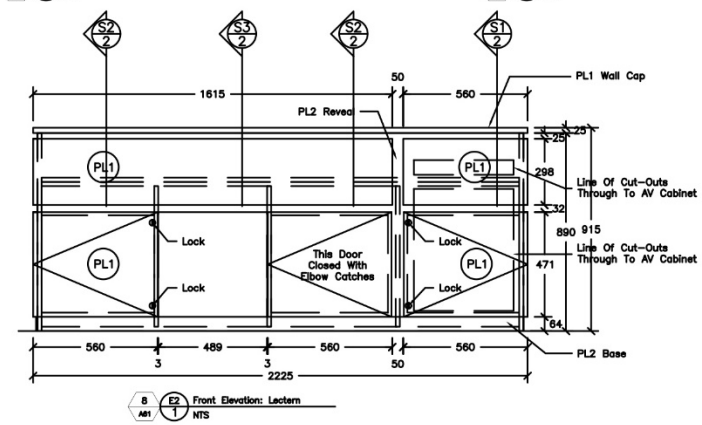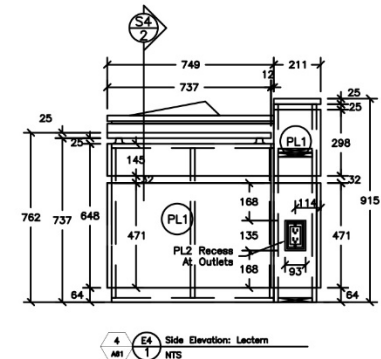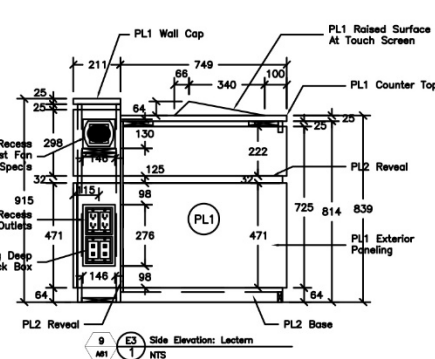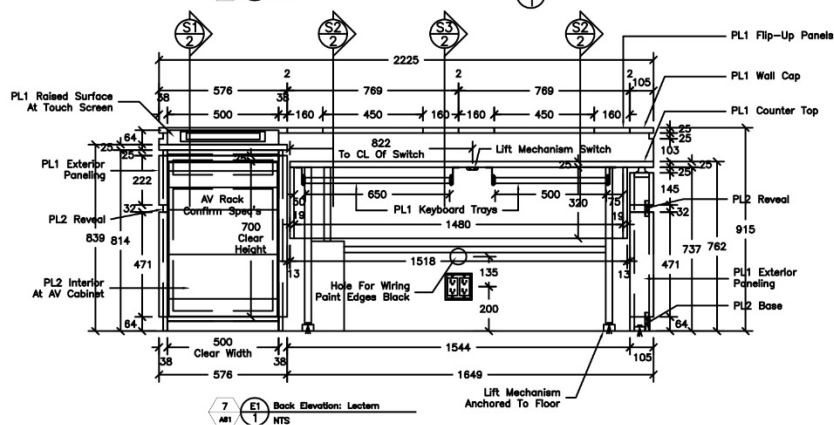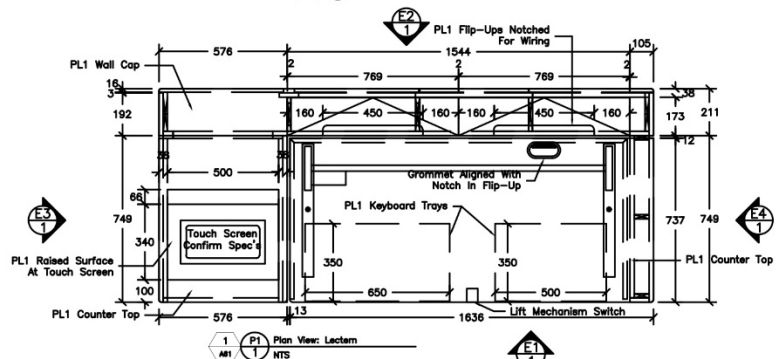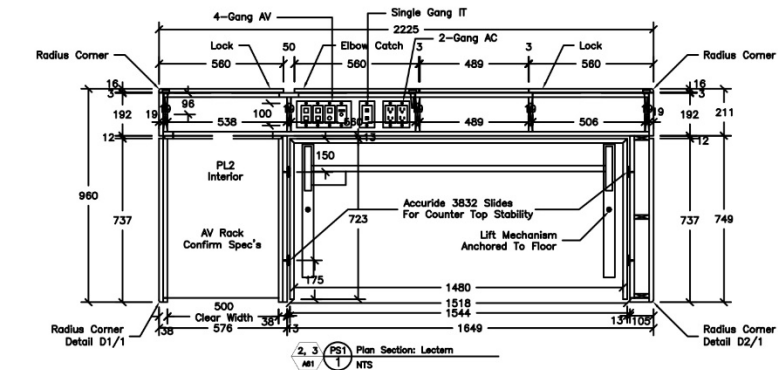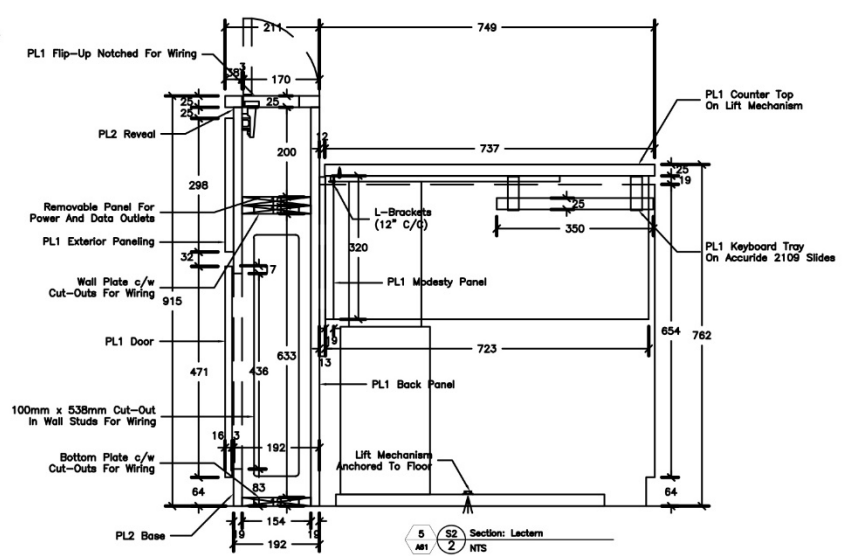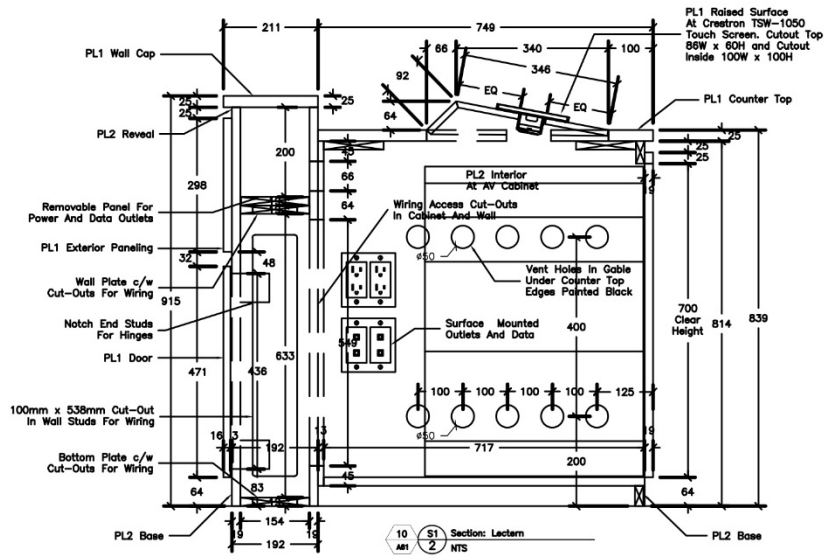
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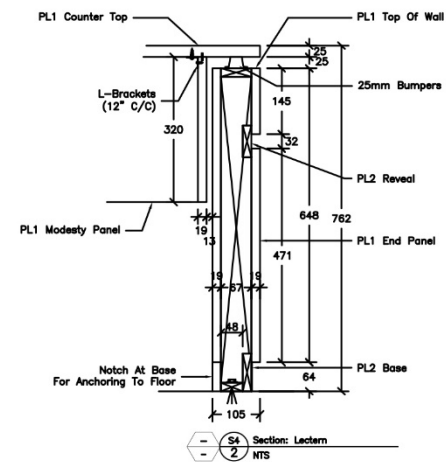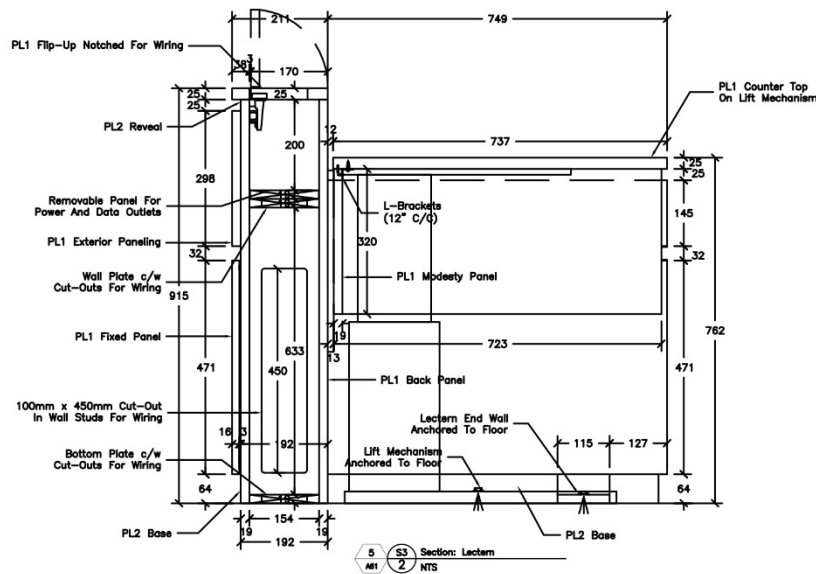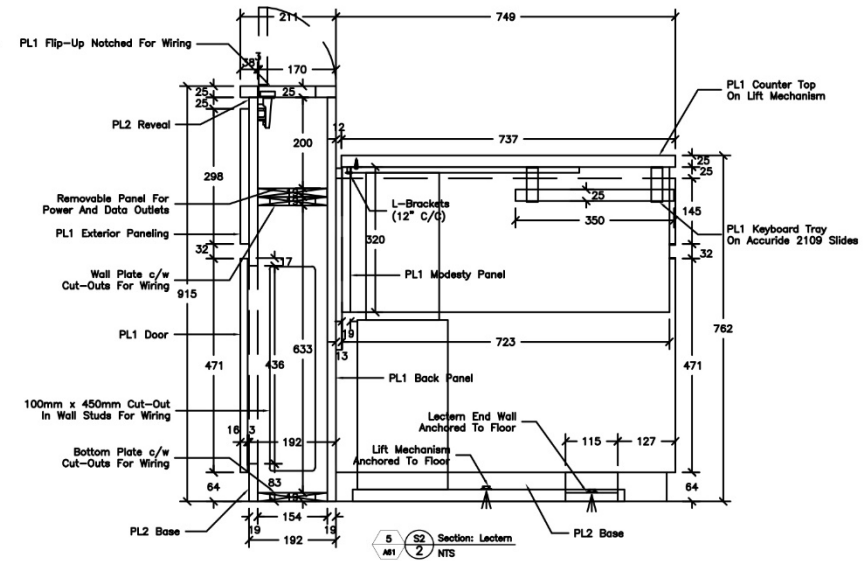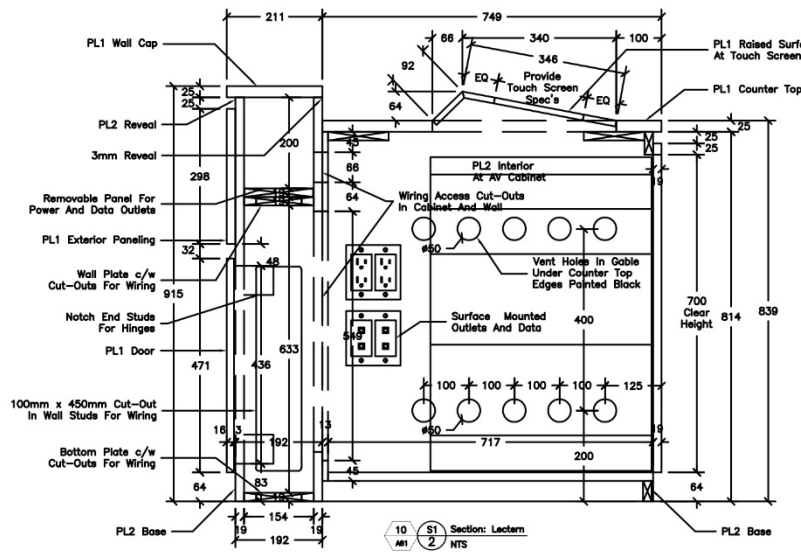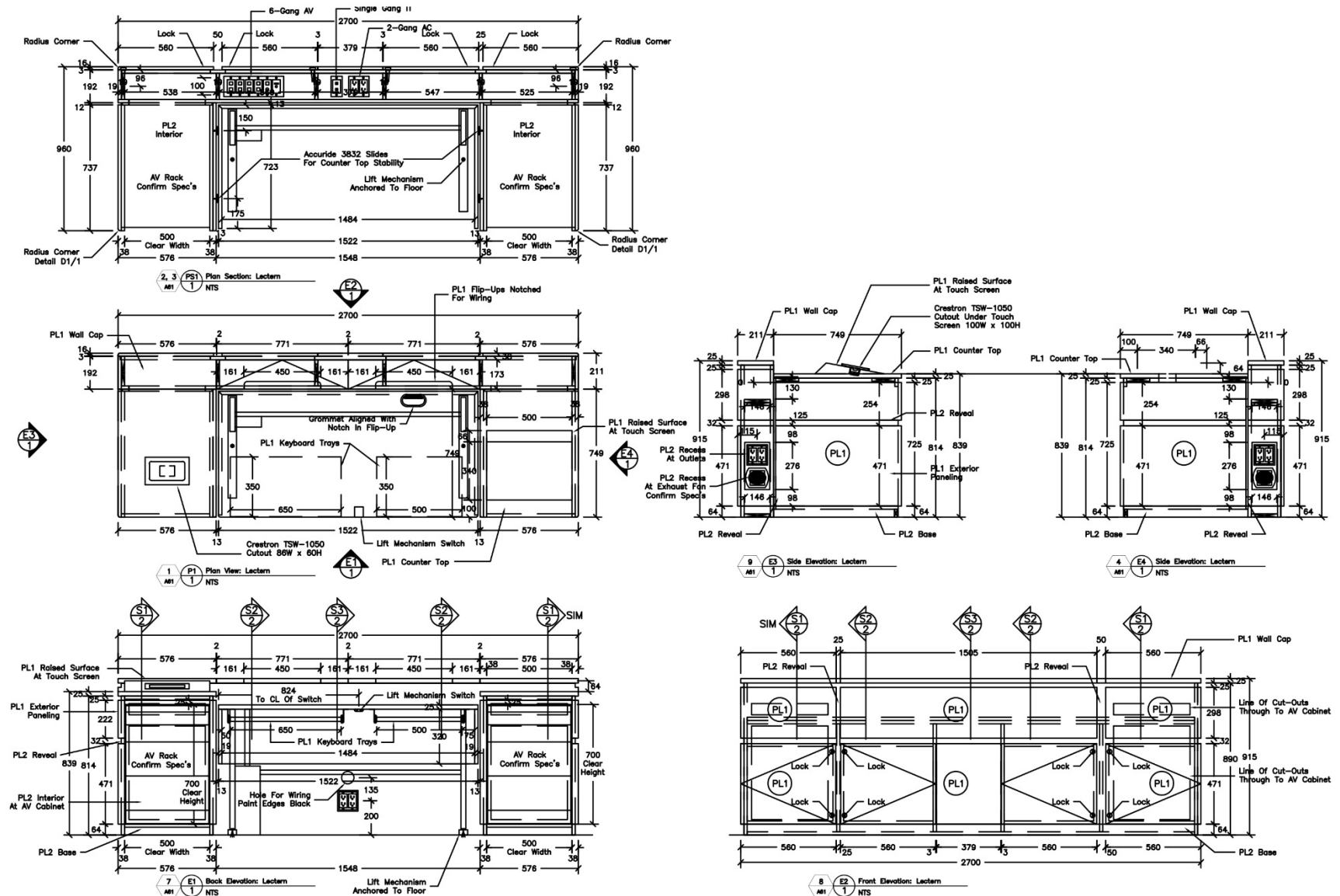
DOUBLE BAY LARGE LECTERN LEFT

DOUBLE BAY LARGE LECTERN LEFT

Section: Lectern — 10 S1 A61 2 — NTS

Section: Lectern — 5 S2 A61 2 — NTS

Section: Lectern — 5 S3 A61 2 — NTS
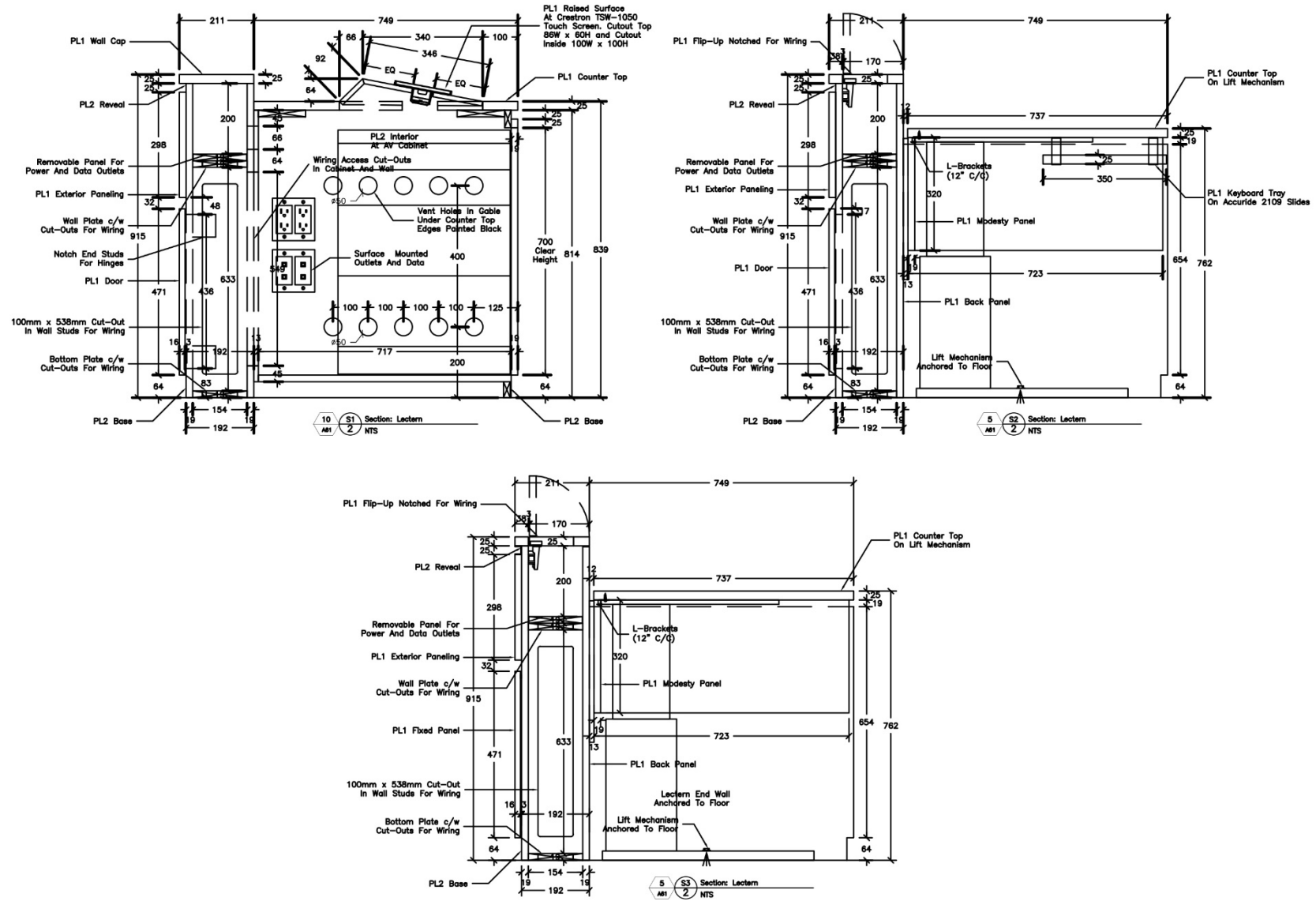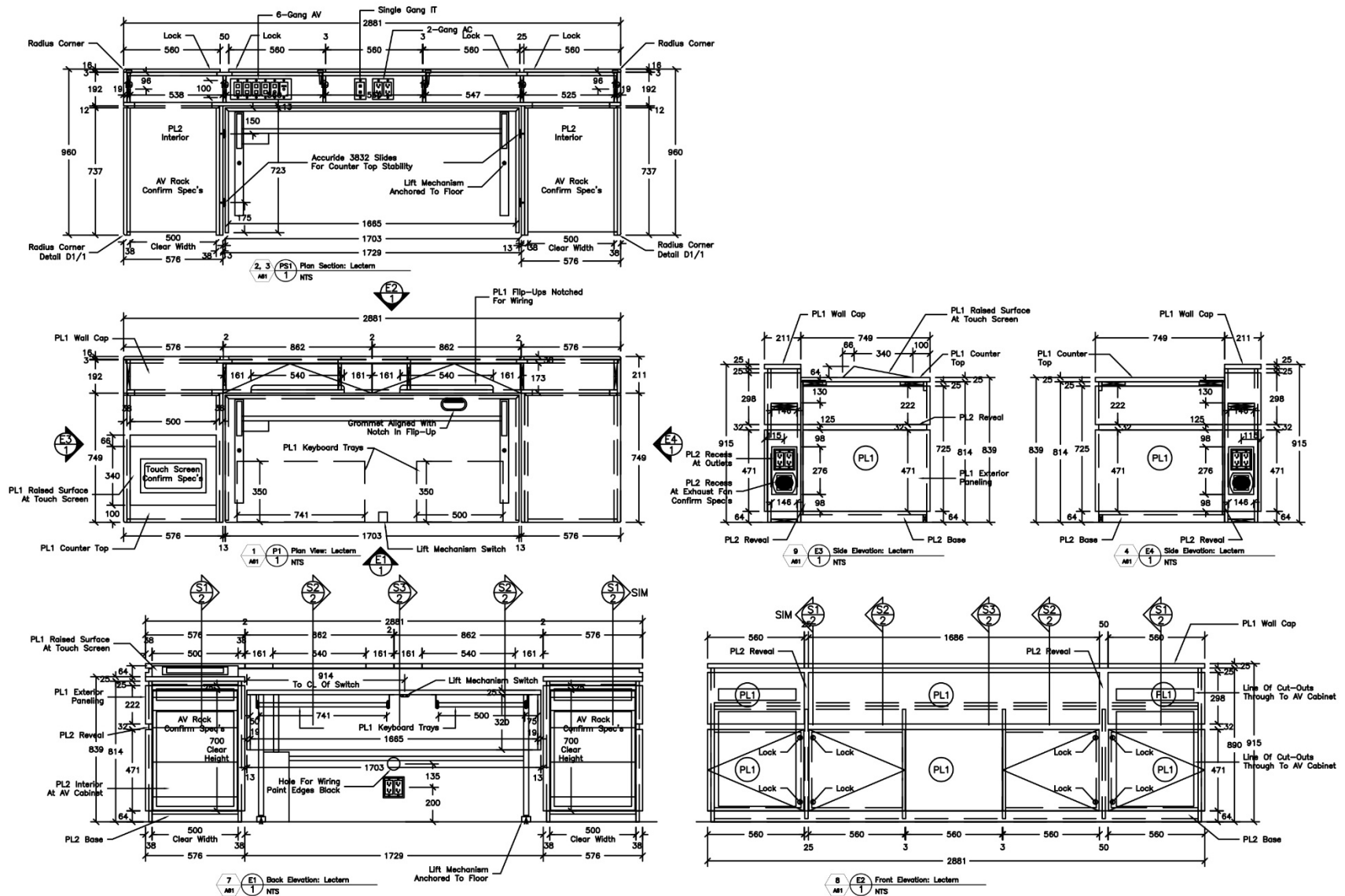
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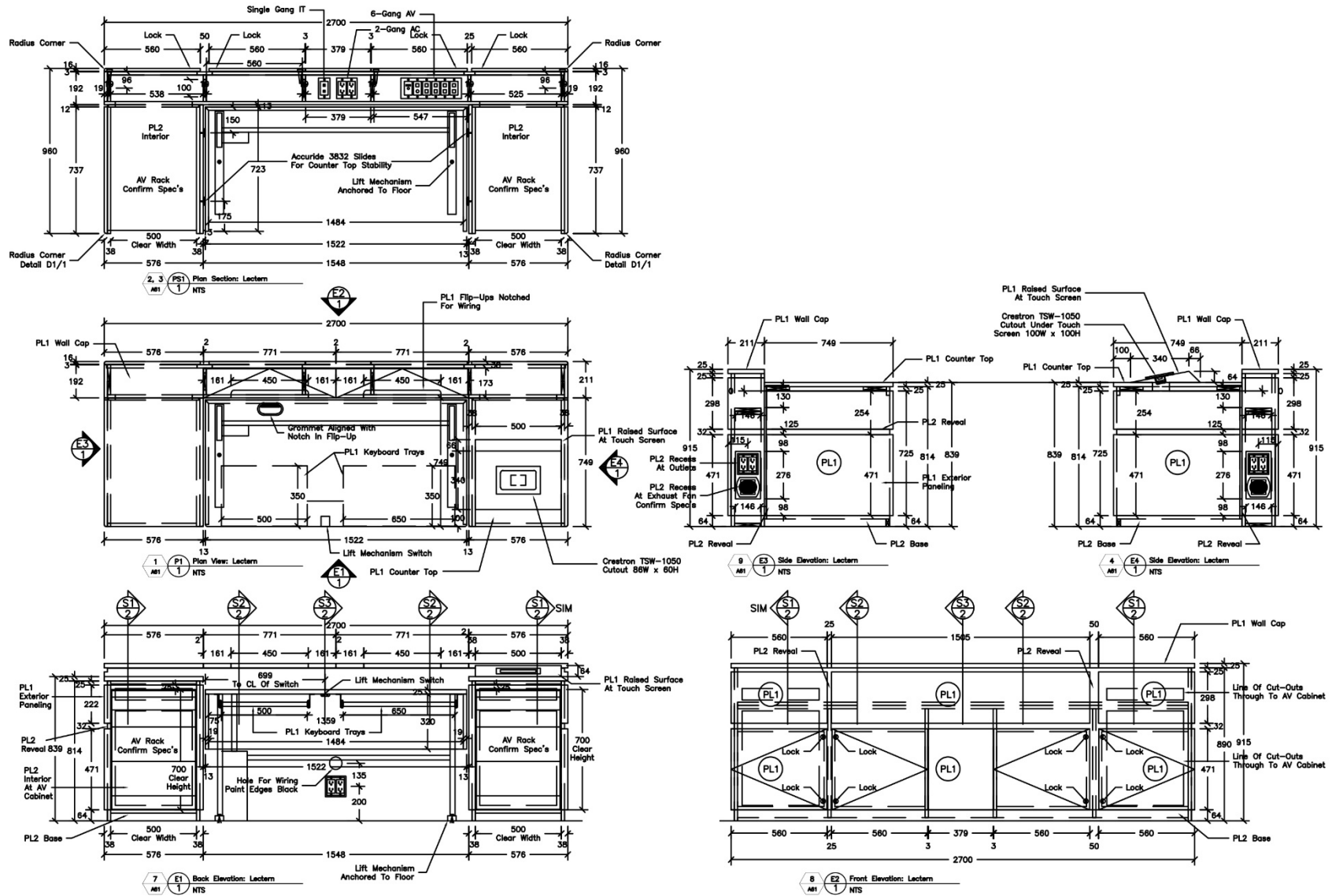
DOUBLE BAY LARGE LECTERN RIGHT

DOUBLE BAY LARGE EXTENDED LECTERN

DOUBLE BAY LARGE EXTENDED LECTERN