Code Analysis Report

Date: 16 April 2020

1. PROJECT INFORMATION

Project Title	**Bennett Cancer Center – Wellness Center**
Project Address	**4450 31st Ave S, Fargo, ND 58104**
Floor Location *(what floor is project on?)*	1st Floor
Building Construction	Foundation: N/A Roof: N/A Exterior Walls: N/A Interior Walls: Steel Frame Construction Other: N/A

APPLICABLE CODES *(pull from city website of jurisdiction project is in)*		**EDITION**
Building Code	☒ IBC ☐ NFPA 5000 ☐ Other:	**2015**
Local Amendments	☒ Yes ☐ No	
Fire Code	☒IFC ☐ NFPA 1 ☐Other:	
Life Safety Code	Life Safety Code (NFPA 101)	
Plumbing Code	☒ IPC ☐UPC ☐Other:	
Mechanical Code	☒ IMC ☐ UMC ☐Other:	
Electrical Code	☐ NEC ☐ Other:	
Energy Code	☐ IECC ☐ NFPA 9000 ☐Other:	
Accessibility Regulations & Standards	☒ ADA 2010 Guidelines ☐ ABA ☐ ICC/ANSI A117.1: Accessible and Usable Buildings and Facilities ☐ Other:	
Other Codes *(including special ordinances, health codes, historic preservation, etc.)*	*[List here]*	

BUILDING CHARACTERISTICS	
Automatic Sprinkler System	☒ Yes ☐ No
Construction Type	☐ Type I ☐ Type II ☒ Type III ☐ Type IV ☐ Type V
Protection	☒ Protected (A) ☐ Unprotected (B)
Total Building Area (sf)	
Project Floor Area (sf)	**6000 sf**

Summary Code Checklist *(use this as your guide to code compliance in your project using the tables below)*	
Step 1	**Determine Which Codes Are Required** ▪ Project Information ▪ Applicable building codes ▪ Building characteristics
Step 2	**Determine Accessibility Requirements**
Step 3	**Occupancy Requirements** ▪ Occupancy Classification ▪ Occupant Load ▪ Review specific occupancy requirements ▪ Compare code and accessibility requirements
Step 4	**Means of Egress Requirements** ▪ Determine quantity and type of means of egress ▪ Calculate minimum widths ▪ Determine arrangement of exits ▪ Calculate travel distances ▪ Determine required signage ▪ Compare code and accessibility requirements ▪ Determine emergency lighting requirements
Step 5	**Fire and Smoke Resistance Requirements** ▪ Determine Fire Barriers/Partitions and Horizontal Assemblies ▪ Determine Smoke Barriers/Partitions ▪ Determine location of opening protectives
Step 6	**Fire Protection Requirements** ▪ Determine fire and smoke detection systems ▪ Determine required alarm system ▪ Determine types of extinguishing systems ▪ Compare code and accessibility requirements
Step 7	**Plumbing Requirements** ▪ Determine types of fixtures required ▪ Calculate number of each fixture required ▪ Determine required toilet/bathing facilities ▪ Review for finishes, accessories, and signage ▪ Compare code and accessibility requirements ▪ Review water conservation requirements
Step 8	**Mechanical & Electrical Requirements** ▪ Determine ceiling heights ▪ Determine types/locations of outlets, switches, fixtures ▪ Determine emergency power and lighting requirements ▪ Compare code and accessibility requirements ▪ Review energy efficiency compliance
Step 9	**Finish and Furniture Requirements** ▪ Review tests and type of ratings required ▪ Determine special finish requirements ▪ Determine special furniture requirements ▪ Compare code and accessibility requirements ▪ Compare requirements during selection and specification
Building Codes calculations will need to be completed and updated throughout the project process. Initially, they are done to help in programming. Then, upon design development they will be checked again for compliance.	

2. ACCESSIBLITY *(per IBC)* [IBC Ch 11]

Chapter/Section	Description
1104.3.1	Common use circulation paths within employee work areas shall be accessible routes
1108.2.2.1	Wheelchair spaces shall be provided in accordance with Table 1108.2.2.1
1109.2	Each toilet and bathing room shall be accessible
1109.5	Where drinking fountains are provided, they must be in accordance with sections 1109.5.1 and 1109.5.2
1109.9	Where fixed or built-in storage elements such as cabinets, coat hooks, shelves, medicine cabinets, lockers, closets and drawers are provided in required accessible spaces, at least 5 percent, but not less than one of each type shall be accessible
1111.1	Required accessible elements shall be identified by the international symbols of accessibility

3. OCCUPANCY CONSIDERATIONS [IBC Ch 3 & 5]

Occupancy Classification *(Check which apply)*

Single Occupancy	☐ Assembly A-1 ☐ Assembly A-2 ☐ Assembly A-3 ☐ Assembly A-4 ☐ Assembly A-5 ☒ Business (B) ☒ Business (B) – Ambulatory Health Care ☐ Education (E) ☐ Factory (F) ☐ Hazardous (H) ☐ Mercantile (M) ☐ Storage (S) ☐ Utility (U) ☐ Residential R-1 ☐ Residential R-2 ☐ Residential R-3 ☐ Institutional I-1 ☐ Institutional I-2 ☐ Institutional I-3 ☐ Institutional I-4
Multiple Occupancies	Occupancy 1 Occupancy 2 Occupancy 3
	Occupancy required separation [Table 508.4] ☒ Yes ☐ No Required hourly rating [x]
Incidental Use Areas [Table 509]	☐ Yes ☒ No List:
Accessory Occupancies [Sec 508.2]	☐ Yes ☒ No List:

Occupancy Risk Factors & Hazards *(Check which apply)*

☒ High number of occupants
☒ Occupants resting or sleeping
☒ Alertness of occupants'
☒ Mobility of occupants
☒ Age of occupants
☒ Hazardous materials used or stored
☒ Occupants generally unfamiliar with building/space
☐ Unusual characteristics of building/space
☐ Special security measures *(prisons, etc.)*
☐ Potential for spread of fire
☐ Other *(list):*

Occupant Load for Tenant, Floor and Building

(If project includes multiple floors, separate calculations are necessary for each floor. You will then total for the entire building.)
NOTE: This process may have to be repeated several times, depending on the number of different uses of spaces being designed.

Location in Building *(Room Name/ Number, etc.) List EACH individually. OK to combine 'like' uses*	**Function (Use) of Space[4]** (Table 1004.1.2)	**Load Factor[2]** (sf/occupant)	**Area[3]** (sf)	**Occupant Load** *Remember rounding rules!*
Fitness	Exercise Rooms	50 gross	348	7
Fitness	Exercise Rooms	50 gross	289	5.8

Nutrition Area	Assembly – Table and Chairs	15 gross	354	23.6
Storage	Accessory Storage/Mechanical equipment	300 gross	127	.4
Environmental Service	Accessory Storage/Mechanical equipment	300 gross	118	.4
Laundry	Accessory Storage/Mechanical equipment	300 gross	63	.2
Waiting	Waiting	7 gross	467	66.7
Check-In/Check-Out	Business	100 gross	509	5.1
Massage Therapy	Outpatient	100 gross	120	1.2
Massage Therapy	Outpatient	100 gross	120	1.2
Massage Therapy	Outpatient	100 gross	122	1.2
Massage Therapy	Outpatient	100 gross	121	1.2
Directors Office	Outpatient	100 gross	101	1
Dietetics Office	Outpatient	100 gross	150	1.5
Dietetics Office	Outpatient	100 gross	150	1.5
Staff Workroom	Business	100 gross	209	2.1
Staff Lounge	Assembly	15 gross	167	11.1
Individual Counselor	Outpatient	100 gross	160	1.6
Individual Counselor	Outpatient	100 gross	146	1.5
Individual Counselor	Outpatient	100 gross	148	1.5
Individual Counselor	Outpatient	100 gross	150	1.5
Group Counselor	Assembly	15 gross	452	30.1
Open Office - Staff	Business	100 gross	444	4.4

NOTES:
1. The 2015 IBC makes a distinction between "gross" and "net" areas for calculating occupant load.
2. "Gross" areas include wall thicknesses and utility spaces (chases, shafts, mechanical/electrical spaces, etc.).
3. Use only whole numbers for areas; round to nearest whole foot.
4. Use the most stringent USE of the space.

Occupant Load for Fixed Seats [Sec 1004.4]	**Occupant Load**
Area 1_____ ☐ Fixed Seats ☐ Continuous Arms ☐ Booth *Show Calculations:*	
Area 2_____ ☐ Fixed Seats ☐ Continuous Arms ☐ Booth *Show Calculations:*	
Area 3_____ ☐ Fixed Seats ☐ Continuous Arms ☐ Booth *Show Calculations:*	
Total Occupant Load for 2nd Floor	405
Total Occupant Load for 1st Floor	171.8 = 172
Total Occupant Load for Building	**577**

4. MEANS OF EGRESS [IBC Ch 10]

Travel Distances	Maximum Travel Distance [Table 1017.2] allowed per IBC [300 ft – With Sprinkler System] Travel Distance provided per print [116 ft]
	Maximum Common Path of Travel Allowed per IBC [100 ft]
	Dead End Corridor Length (Sec 1020.4) allowed per IBC ☐ 20' ☒ 50' ☐ Other ____

	Maximum Dead End Corridor Length provided per print [0]
Exit Requirements	Single Exit Allowed [Table 1006.2.1 & 1006.3.2(2)] ☐ Yes ☒ No
	Required Number of Exits [Table 1006.3.1] ☐ 1 ☒ 2 ☐ 3 ☐ 4
	Number of Exits Required to be Accessible ☐ 1 ☒ 2 ☐ 3 ☐ 4

Total Exit Widths Required [Sec 1005.3]
(OL x egress width variable = calculated width)

Egress Type	Location *(Room Name/ Number, etc.)*	Calculated Exit Width *(OL x egress width variable = calculated width)*	Required Width *(indicate what is greater – code or calculation)*
☒ Door ☐ Stairway ☐ Corridor	**Main Entrance**	**172 x .2 = 34.4**	**35”**
☒ Door ☐ Stairway ☐ Corridor	**Emergency Exit**	**172 x 0.2 = 34.4**	**35”**
☐ Door ☐ Stairway ☐ Corridor			
☐ Door ☐ Stairway ☐ Corridor			
☐ Door ☐ Stairway ☐ Corridor			

Remoteness of Exits Determined by [Sec 1007] *(Check one)*
☒ ½ Diagonal Rule – required distance [x] ☐ 1/3 Diagonal Rule – required distance [x]

[116 ft] Overall Diagonal of area calculating (space, tenant or floor)
[78 ft] Provided distance between exits

Area of Refuge Required ☐ Yes ☒ No

Means of Egress Components to Research *(indicate applicable information to your project below)*

- Doors: Type, swing, hardware, threshold, clearances, fire rating
- Stairs: Type, riser height, tread depth, nosing, width, handrail
- Ramps: Slope rise, landing, width, edge detail, finish, handrail, guard
- Corridors: Length, width, fire resistance rating
- Aisles: Fixed seats no fixed seats, ramp/stepped or flat, handrails
- Intervening Rooms: Allowed, maximum number, maximum distance
- Signage and Lighting: Exit signs, photoluminescent markings, emergency lighting, evacuation diagrams
- Special Occupancy Egress Requirements: Assembly, institutional, healthcare, detention center, other

Chapter/Section	Description
1003.2	Means of egress shall have a height of not less than 7 feet 6 inches above the finished floors
1003.3	Protruding objects on circulation paths must meet the requirements of sections 1003.3.1-1003.3.4
1009.1	Accessible means of egress required
1013.1	Exit signs where required
1013.3	Exit signs illuminated

5. FIRE RESISTANCE [IBC Ch 7, 9, 10]

	Location	Type of Assembly	Hourly Rating Required

	(room name/number)	*(Fire barrier or fire partition)*	
Fire Separation Area	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Occupancy Separation(s) [Table 508.4]	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Dwelling / Sleeping Unit(s)	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Incidental Use Areas [Table 509]	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Vertical Shaft Enclosures [Sec 712, 713]	N/A	**N/A**	☐ 1 hr ☐ 2 hr
Exit Stairway(s) [Sec 713]	N/A	**N/A**	☐ 1 hr ☐ 2 hr ☐ 3 hr
Exit Access Stairway(s)	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Horizontal Exit(s) [Sec 1026]	N/A	**N/A**	☐ 2 hr ☐ Other
Area(s) of Refuge	N/A	**N/A**	☐ 1 hr ☐ 2 hr ☐ 3 hr
Exit Passageway(s)	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Exit Access Corridor(s)	N/A	**N/A**	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr
Smoke Barriers and Partitions			
Smoke Compartments	Location: Waiting	☐ 20 min ☒ 1 hr ☐ 2 hr ☐ 3 hr ☐ 4 hr	
Vertical Shaft(s)	Location: N/A	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr ☐ 4 hr	
Vestibule(s)	Location: N/A	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr ☐ 4 hr	
Other	Location: N/A	☐ 20 min ☐ 1 hr ☐ 2 hr ☐ 3 hr ☐ 4 hr	
Opening Protectives [Section 716, Table 716.5] *(Rated assemblies indicated above require proper opening protectives)*			
Rated Door Assemblies	Location:	Hourly rating: [N/A]	
Smoke Doors	Location: Check-In/Check-Out	Hourly rating: [2]	
Fire Window Assemblies [Table 716.6]	Location: N/A	Hourly rating: [N/A]	
Rated Glazing & Frames	Location: Check-In/Check-Out	Hourly rating: [2]	
Specific Hardware Required	Location: N/A	Hourly rating: [N/A]	

6. FIRE PROTECTION SYSTEMS [IBC Ch 7, 9, 10]

Detection Systems	
Smoke Detectors	Location: All Rooms/Areas
Heat Detectors	Location: All Rooms/Areas
Carbon Monoxide Detectors [Sec 915]	Location: Massage Therapy Rooms and Counselling Rooms
Manual Fire Alarm(s)	Location: Check-In/Check-Out, Nutrition, Staff Open Area, Hallways
Alarm Systems	
Visual/Audible Alarms	Location: Open Office – Staff, Hallways, Waiting, Check-In/Check-Out

Emergency Voice/ Alarm Communication System(s)	Location: Open Office – Staff, Hallways, Waiting, Check-In/Check-Out
Extinguishing Systems	
Fire Extinguishers [Sec 906]	Location: Every 75 Feet, Class A
Standpipe(s) [Sec 905]	Location: N/A
Automatic Sprinkler System(s) [Sec 903]	Location: All Areas

7. PLUMBING [IBC Ch 29 & IPC Ch 4]

Occupant Load for Determining Plumbing Fixture Count **[127]**

Plumbing Fixtures

(If multiple floors/tenant spaces exist, you must have multiple charts.)

NOTE: This process may have to be repeated several times, depending on the number of different uses of spaces being designed.

Fixture Type	Fixture Ratio *[Table IBC 2902.1 or IPC 403.1]*	Standard Fixtures Required				Total Required	
		Standard Fixtures		Accessible Fixtures			
		Male	Female	Male	Female	Male	Female
Water Closet	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50	1	1	1	1	2	2
Urinal		1	-	1	-	2	-
Lavatory	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80	1	1	1	1	2	2
Bathtub	N/A						
Shower	N/A						
Service Sink	N/A						
Drinking Fountain	1 per 100					2	
Other:							

Plumbing Elements to Research *(indicate applicable information to your project below)*

- Fixtures: Mounting heights, clear floors pace, faucet/control locations, projections, water consumption
- Faucet/Controls: Ease of operation (i.e. lever, automatic, etc.) water consumption, water temp control
- Grab Bars: Location, lengths, heights, orientation, additional required for use
- Accessories: Mounting heights control locations, projections, clear floor space
- Finishes: Smooth/nonabsorbent, slip resistant, thresholds, special locations
- Room: Turning space, overlapping clear floor space, privacy, signage, stall size, door swing

Chapter/Section	Description
IBC 2902.1.2	Family/assisted-use toilet rooms shall be identified for use by either sex
IPFC 402.1	Fixture finish: Plumbing fixtures shall be smooth, impervious surfaces free from defects and concealed fouling surfaces
IPC 403.5	Drinking Fountains shall be located on an accessible route
IPC 405.3	Fixture install: Water closets, urinals, lavs and bidets cannot be • closer than 15" OC from any side wall, partition, vanity or other obstruction; exception is an accessible children's water closet shall be set not closer than 12" OC • closer than 30" center-to-center between adjacent fixtures • 21" clearance in front of WC, urinal, lav or bidet to any wall/fixture door WC compartment cannot be less than 30"w x 60"d
IPC 410.3	Not fewer than 2 drinking fountains, with one complying to people using a wheelchair.

8. Mechanical & Electrical Requirements

Ceiling Heights *(Indicate all Location/Heights)*		
Special Types of Outlets and/or Circuits	☐ Dedicated outlets	Mounting Height(s):
	☐ Ground fault circuit Interrupter (GFCI)	Mounting Height(s):

	☐ Arc fault circuit interrupter (AFCI)	Mounting Height(s):
	☐ Tamper-resistant outlets	Mounting Height(s):
	☐ Other	Mounting Height(s):

Research Additional Mechanical & Electrical Elements *(indicate applicable information to your project below)*

Chapter/Section	Description

9. INTERIOR FINISHES [IBC Ch 8, 12, 21, 23, 24, 25, 26]

Interior Wall and Ceiling Finish Classification [Table 803.11]

Exit Access Corridors	☐ Class A	☒ Class B	☐ Class C
Exits (stairs, passageways, etc.)	☐ Class A	☒ Class B	☐ Class C
Rooms and Other Spaces	☐ Class A	☒ Class B	☐ Class C

Interior Floor Finish

Exit Access	☐ Type I	☒ Type II
Exit	☐ Type I	☒ Type II

Interior Finishes to Research *(indicate applicable information to your project below)*

- Wallcoverings: Vinyl, textile, expanded vinyl, carpet, etc.
- Stretch Fabric Systems
- Light Transmitting Plastics Wood Paneling/Veneers
- Decorative Molding/Trim
- Curtains, Draperies, Fabric Hangings, etc.
- Interior Trim
- Floor-Wall Base
- Suspended Ceiling System
- Carpet: Broadloom, tile, padding
- Hardwood & Resilient flooring
- Foam plastics
- Furniture

Chapter/Section	Description
802.3	Decorative materials and trim shall be restricted by combustibility
803.1.2	Interior wall and ceiling finish materials tested in accordance with ASTM E84 or UL 723
803.11	Laminated products factory produced with a wood substrate
805.1	Combustible materials shall comply with sections 205.1.1 through 805.1.3.
1204.1	Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings or shall be provided with artificial light
1210.1	Floor finishes shall have a smooth, hard, nonabsorbent surface. The intersection of the floors to walls shall have a smooth, hard, nonabsorbent surface that extends at least 4” onto the wall.
1210.2	Walls and partitions within 2 feet of fixtures shall have a smooth, hard, nonabsorbent surface to a height of 4 feet. Materials shall be of a type that is not adversely affected by moisture.
2509.2	Water-resistant gypsum backing board shall be used as the base for wall tile in water closets.