Robert Crown Center and Ice Rink Complex

Evaluation of Existing Facility and Infrastructure Report

Phase I - Existing Conditions Survey

Phase II - Recommendations & Costs

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Evaluation of Existing Facility & Infrastructure Report

Executive Summary & Cost Estimate Recommendations

Constructed in 1975, the Robert Crown Center provides community services and programs for the City of Evanston. The one-story, 61,000 square foot facility contains an ice rink with seating for 1,000 spectators, a small studio-practice rink, one basketball-sized gymnasium, a nursery-child care room, a variety of program/multipurpose rooms, and the associated offices, locker rooms, and equipment rooms to support the vast variety of Crown Center activities.

Over the past several of years, a number of civil, architectural, structural, and mechanical infrastructure problems have developed. Because of these problems, the Crown Center is perceived to have experienced a significant degree of physical deterioration.

Epstein, as the Prime Consultant, and the Epstein team of specialized sub-consultants, was retained by the City of Evanston to prepare a comprehensive analysis of the buildings existing systems, including building and ADA code compliance. The intent of this analysis was to provide the city with detailed information regarding facility renovation or reconstruction including estimating construction costs and phasing options.

The results of the Epstein team's efforts are provided in this document which is broken down into two categories: Phase 1: Analysis of Existing Conditions & Phase 2: Recommendations. Immediately following this page Epstein has provided for quick reference preliminary estimates of probable construction cost for the immediate needs of the Robert Crown Center & Ice Rink Complex, a phasing strategy for implementation of the report recommendations and probable construction estimates for facility reconstruction.

Cost Item Summary
Phase II – Preliminary Estimate of Probable Construction Cost for the Robert Crown Center – Immediate Needs

I.	Architectural / Civil		
	A. Site Work / Building Entry	$154,600	
	B. Building Façade Renovation	49,295	
	C. Classroom Renovations		
	1. Multi-Purpose Room A / B (A-103)	9,922	
	2. Craft Room (A-106)	12,806	
	3. Game Room (A-119)	5,623	
	4. Nursery (A-124)	4,379	
	D. Kitchen (A-105)	24,850	
	E. Men's and Women's Locker Rooms (A-112 thru A-115 and A-116 thru A-118)	47,779	
	F. Offices (A-125 thru A-132 and A-110)	25,807	
	G. Concession Stand (A-120 thru A-121)	24,499	
	H. Classroom Corridor (A-102)	4,893	
	I. Entry Vestibule, Lobby Concourse (A-101, A-133, A-134)	55,188	
	J. Gymnasium (A-109)	80,925	
	K. Team Rooms (B-121, B-118, B-112, B-109)	49,760	
	L & M. Public Washrooms (B-117, B-116, B-115, B-113)	201,000	
	N. Studio Rink (B-124)	61,104	
	O. Main Ice Rink (B-106)	476,458	
	P. Mechanical Room (B-104)	see Engineering Costs	
	Q. Warming Room (B-101)	see Engineering Costs	
	R. Surfacer Room (B-105)	3,655	
	S. Rubber Skate Tile Floor	170,296	
	T. ADA Hardware	18, 000	
	U. ADA Signage Allowance	12,000	
	Subtotal Architectural / Civil	$1,492,839	
II.	Structural		$ 80,786
III.	Mechanical		712,500
IV.	Electrical (includes $38,000 for lighting increase in foot candle levels)		335,100
V.	Plumbing		276,100
VI.	Fire Protection		271,500
VII.	Roofing / Skylights		337,530
VIII.	Refrigeration		199,300
	Total		$3,705,655
	Contractors' Overhead and Profit (15%)		555,848
	Subtotal		$4,261,503
	Contingency (20%)		852,300
	Immediate Needs Costs Grand Total		$5,113,803
	Ten Year Needs Cost Total*		$710,700

(in 2003 dollars)

*Includes 15% overhead and profit and 20% contingency

Phase II - Phasing Strategy for Implementation of Report Recommendations

In terms of phasing the construction work for the proposed Phase II Report improvements, the immediate interior life-safety issues should be addressed first. Our opinion is that this phase of the work should include remediation of the Structural issues and implementation of the Refrigeration work. The gas detection system and ventilation system within the mechanical Room, B-104, is a necessary, code required life-safety system which needs to be addressed immediately. It also makes sense to group the remainder of the compressor Refrigeration contract with this phase of the work. The Structural bracing of the main rink walls, shoring the grandstand, and structural repair of additional cracked masonry should also be addressed immediately. The above work should constitute the initial phase of any proposed renovation project.

Upon completion of the above items, the most logical approach is to proceed from the outside toward the inside of the building. The civil and site work are of critical importance to prevent any flooding inside the building, which would result in further deterioration of the equipment and finishes within the structure itself. Therefore, the roof and skylights are another phase of the work which would be essential to complete before any work on the interior of the building is attempted. This strategy of securing the integrity of the site and building envelope will also include the architectural work of the exterior walls of the building. This would include masonry repair and tuckpointing, metal louver work, exterior ramps, rails, and concrete slabs.

Once the exterior of the building envelope is secured, the Architectural, Mechanical, Electrical, Plumbing and Fire Protection may proceed on the basis of an interior renovation project. Obviously the installation of such items as new lighting, sprinklers and mechanical equipment, and ductwork, is intimately integrated with architectural finishes and floor plan layouts. Any new configuration of locker rooms, bathrooms, offices, etc. would be constructed concurrently with the installation of new lights and sprinklers. The construction of new Mechanical, Lighting, Fire Alarm, Sprinklers and Plumbing would result in the destruction of existing architectural finishes, (ceiling and walls) and should be implemented at the same time as the construction of new architectural finishes. Therefore, the items are grouped together in the same phase of work.

However, the architectural work in large spaces such as the Studio Rink, Main Rink and Gym, have been isolated as a separate phase. The Mechanical, Electrical, Plumbing and Fire Protection work in these spaces

has been included as a part of similar work to be executed at one time in the entire building as a whole. The reason is that these items operate as complete systems and cannot be broken into smaller, separate pieces. However, because the architectural partitions in these large spaces are not being revised and are not intimately tied to the Mechanical Electrical or Plumbing or Fire Protection locations, it is possible to execute the architectural finishes and modifications in these spaces as a separate phase of work.

The following phasing costs include a "phasing premium" in addition to the total phase II costs outlined previously. If the renovation project is executed in a phased manner, there are likely to be additional charges from the general contractor for mobilization and equipment due to multiple start-up dates with "down-time" between phases. The issue of cost escalation is also relevant. In the recent past, this has been about 3%-4% per year. These costs must also be kept in mind, but are not factored in the figures on the following pages.

Phase II - Phasing Costs for the Report Recommendations

Phase A.

1. Structural Repairs and Improvements	$80,786
2. Refrigeration Improvements	199,300
Subtotal	280,086
Contractors Overhead and Profit 15%	42,129
Subtotal	322,215
Contingency 20%	64,443
Subtotal	386,658
Phasing Premium 8%	30,932
Total for Phase A	**$417,590**

Phase B.

1. Architectural Site (Items A1-A8) and Civil Site Work	$154,600
2. Building Façade Renovation (Items B1-B8)	49,295
3. Roofing and Skylights	337,530
Subtotal	541,425
Contractors Overhead and Profit 15%	81,213
Subtotal	622,638
Contingency 20%	124,527
Subtotal	747,165
Phasing Premium 8%	59,773
Total for Phase B	**$806,938**

Phase C.

1. Architectural Interior Work (Excludes: Architectural work in Main Rink and Studio Rink, Gym, Skate Tile Floor throughout and signage) (Includes: Items C1-C31, D1-D9, E1-E12, F1-F10, G1-G9, H1-H6, I1-I13, J1-J9, K1-K8, L/M1-L/M16, P1-P2, Q1-Q2, R1-R5 and T)	$488,161
2. Mechanical Interior Work	712,500
3. Electrical Interior Work	335,100
4. Plumbing Interior Work	276,100
5. Fire Protection Interior Work	271,500
Subtotal	2,083,361
Contractors Overhead and Profit 15%	312,504
Subtotal	2,395,865
Contingency 20%	479,173
Subtotal	2,875,038
Phasing Premium 8%	230,003
Total for Phase C	**$3,105,041**

Phase D.

1. Architectural Interior Work (Includes: Items J1-J9, N1-N8, O1-O13, S, U, Gym, Main Rink, Studio Rink, Skate Tile Floor and Signage)	$800,783
Contractors Overhead and Profit 15%	120,117
Subtotal	920,900
Contingency 20%	184,180
Subtotal	1,105,080
Phasing Premium 8%	88,406
Total for Phase D	**$1,193,486**

Summary

Phase A	$417,590
Phase B	806,938
Phase C	3,105,041
Phase D	1,193,486
Phased Grand Total	**$5,523,055**

Phase II – Estimate of Probable Building Reconstruction Costs

The estimated costs outlined below are based on A. Epstein and Sons, Inc. and the City of Evanston's, recent experience in the construction of similar building types, and Industry Standards outlined in R.S. Means Database, and Construction Cost Data Publications. The figures were generated based on estimating the cost for a new facility of the same size (61,000 S.F.) and containing the same program. The ultimate square foot cost represents a "blended" number which was derived by taking the proportion of the building which is Ice Rink (40,000 S.F.) and the proportion which consists of smaller classroom specialty spaces (20,000 S.F.), and combining them into an aggregate overall cost.

DIV 01.000	General Conditions	$1,245,000
	Overhead and Profit	622,500
DIV 02.000	Site Work	847,000
DIV 02.1700	Landscaping	249,000
DIV 03.000	Concrete	1,350,000
DIV 04.000	Masonry	722,000
DIV 05.000	Metals	1,096,000
DIV 06.000	Wood and Plastic	250,000
DIV 07.000	Thermal and Moisture Protection	622,500
DIV 08.000	Doors and Windows	996,000
DIV 09.000	Finishes	498,000
DIV 10.000	Specialties	248,000
DIV 11.000	Equipment	N.I.C (not included)
DIV 12.000	Furnishings	N.I.C (not included)
DIV 13.000	Special Construction	358,500
DIV 14.000	Conveying Systems	40,000
DIV 15.000	Mechanical	2,091,500
DIV 16.000	Electrical	1,578,000
	Total	**$12,814,000**
	Cost per Square Foot	**$210**
Demolition Cost of Existing Building*		$300,000

*The demolition cost does not include a hazardous material survey or hazardous material removal or site remediation costs.

The building reflected in the above estimate would have a useful life of 25-30 years.

ROBERT CROWN CENTER AND ICE RINK COMPLEX

EVALUATION OF EXISTING FACILITY AND INFRASTRUCTURE REPORT
PHASE I – EXISTING CONDITIONS SURVEY

Table of Contents

Section 1
Project Overview

PROJECT OVERVIEW

Background

Constructed in 1974, the Robert Crown Center and Ice Rink Complex was designed by the Evanston architectural firm of O'Donnell Wickland Pigozzi Architects (the firm is now OWP&P, headquartered in Chicago). The facility is a one-story, masonry building containing approximately 61,000 square feet and is one of the major recreational facilities for the City of Evanston.

Photo O1: Main Entrance façade of the Robert Crown Center

The complex houses a large ice skating arena with seating for approximately 1,000 spectators, a small studio rink, a basketball-size gymnasium, a pre-school room, and a variety of other program/multipurpose rooms. In addition, there are locker rooms, showers and toilet facilities; a refreshment-food stand; building reception with adjacent administrative offices; storage and equipment room; and building support rooms.

Over the past several years, a number of civil, structural, architectural, and mechanical issues have developed in the complex. These issues include flooding of the on-site parking areas during heavy rainstorms, rainwater leaking through the skylights, rusting exterior parking lot lighting, structural separation and outward bowing of the east wall, cracking and separated bridging supports at several masonry wall locations, poor interior lighting, bubbling of the gymnasium flooring, lack of visual security to the activity areas, ADA compliance, inadequately sized and poorly secured locker rooms.

Photo O-2: Main Street façade of the Robert Crown Center

As a result of these on-going and increasing lists of issues, the City staff was directed to retain an outside consultant to provide an in-depth analysis of the complex's existing systems. A Request for Proposals was issued in March 2002, with a Project award May 30, 2002.

Scope of Services / Approach

The Scope for this project has been divided into two phases: Phase I is a complete in-depth survey of the existing physical conditions at the Robert Crown Center. A report is then generated, which describes the state of the existing complex.

This is accomplished through review of the 1974 construction drawings, on-site visual observation, discussions with the City staff, review of all applicable building Codes, and specific destructive/non-destructive testing. Additionally, the survey team is comprised of five specialized professional firms, tailored to address the specific issues/areas of concern with the condition of the existing facility.

Phase II begins with an analysis of the results outlined in the Phase I Report. From this analysis, recommendations shall be developed for the renovation/rehabilitation of the existing facility. These recommendations will not only be accompanied by supporting evidence, as a basis for authoring the recommendations, but the Phase II Report will also include construction cost estimates for each recommendation and phasing plans for implementing the work.

Photo O-3: Large ice skating arena

Photo O-4: Ice arena spectator seating

Applicable Codes

The following Codes are currently enforced by the City of Evanston:

- BOCA National Building Code, 1996, with City of Evanston amendments
- National Electrical Code, 1996, with City of Evanston amendments
- International BOCA Mechanical Code, 1996, with City of Evanston amendments
- Illinois Plumbing Code, 1998, with City of Evanston amendments
- NFPA 101, 1994
- Illinois Accessibility Code, 1997
- City of Evanston Zoning Ordinance

Section 2
Architecture

ARCHITECTURE

Overview

The Robert Crown Center is a one story masonry building consisting of a limited number of classrooms, support spaces, gymnasium and ice rinks. The building is approximately 61,000 S.F. This section of the report investigated the architectural integrity and condition of the exterior walls and windows, interior finishes and a Building Code Review as per the 1996 BOCA code, currently in force in Evanston. The integrity of the roof and skylights is covered under a separate section of the report, as is the ADA accessibility analysis of the existing facility.

Photo A-1: Overall Front Entry

Investigation Methods

Various methods were utilized to investigate the above mentioned issues.

Research: The building code analysis was conducted using the 1996 BOCA Code along with construction documents (dated 2/27/74) of the Robert Crown facility. Additional telephone conversations were conducted with BOCA officials at their headquarters in Country Club Hills, Illinois, as was required to clarify specific code issues.

Interviews: Interviews and discussions were conducted with various members of the Robert Crown staff to document existing and past problematic issues with the facility.

Visual Observations: Visual observations were conducted of the exterior masonry walls and are documented herein. In addition, visual observations were also conducted of the interior finishes and are documented on a room by room basis.

Observations

See the following individual sections for analysis and results.

Conclusions

Exterior Walls:

The exterior wall masonry is generally in good condition. The white patina that is observed on the walls around the entire perimeter up to 8'-8" above the ground is a "graffiti block" product, not deterioration of the bricks or mortar. The few areas that exhibit cracked or chipped masonry can be replaced and the integrity of the wall maintained. Areas below the skylight sills, and sloped masonry sills below the light monitors, exhibit mortar deterioration. The mortar in these areas needs to be ground out and re-pointed with new mortar. The masonry in these areas needs to be cleaned. The drawings indicate and field observations verify that the exterior windows in offices A-127 and A-128 are direct glazed into the brick with a 1/4" vinyl or butyl seal around the perimeter. A higher quality, thermally broken, aluminum framed window element should be considered for replacement.

Photo A-2: North Side Masonry Wall – Showing Graffiti Block

Grading on the north side of the building needs to be addressed to create positive drainage of storm water and ground water away from the building. Skylights need replacing or extensive repairs; skylight and roof conditions and conclusions are documented in the roofing section of this report.

Photo A-3: North Side Drainage Condition

The entry area to the building requires extensive remodeling to conform with ADA accessibility requirements. This is documented in a separate section of this report.

Architecturally, the entry area is a deeply recessed, dark, space with entry doors which are barely visible from the street. The large exterior canopy consists of exposed steel beams and metal deck supported by cast-in-place concrete columns. The concrete slab, steps, ramps, and walls are stained due to chewing gum droppings. The condition of the roof and skylights over this area are documented in a separate section of this report as well as the ADA compliance of the entry area.

Aesthetically, this area is in need of significant architectural and lighting improvements.

Interior Finishes:

The specifics of the interior finishes of each room are documented in the Room Finish Survey as part of this study. In general, the entire building has a time worn appearance. Vinyl sheet flooring in the gymnasium locker rooms requires replacing as does the carpet in the office area. The floor tiles are chipped and worn in the Community Center portion of the building. The skate floor surface is dark brown and, as such, adds to the dark and dingy interior lighting conditions. The metal slat ceiling is in generally good condition but is dark in color and has no acoustical properties.

Visual Observations

Architectural Review of Exterior Walls

General: Around the entire building, the brick is discolored due to "graffiti block". The "graffiti block" is 8'-8" above grade.

West: The masonry is in good condition.
The mortar joints are in good condition.
The metal louver at the south end needs repainting.

South: Vertical control joints in the masonry are well sealed and in good condition.
The scupper board needs repainting.
The concrete retaining wall for the planter is in good condition.
Mortar joints are generally solid except as noted below.
No chipped masonry is present.
Brick and mortar joints are discolored under the sill of the skylight.
Mortar joints are chipped and need repainting under the skylight.
The skylight and sill need replacing or repair.
There is slight efflorescence on the underside of the masonry light monitor.
The mortar is deteriorated below the sloped masonry sill at the light monitor in the gym.

East: The masonry control joints are well sealed.
Masonry joints and mortar are in good condition.
All hollow metal access doors are in good condition.
Metal rail requires reattachment.
Mortar joints below the sloped masonry sill of the light monitor needs re-pointing.
Metal doors need repainting.
A handrail in the concrete wall is required.
The concrete slab at double doors is cracked; needs replacing– 16 ft x 13 ft.
Steel canopy is in good condition.
Scupper board needs repainting.

Photo A-4: South Wall Skylight

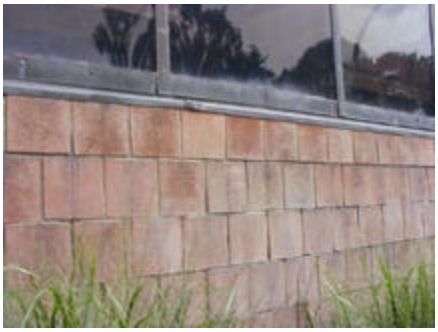


Photo A-5: South Wall Sill Detail

Photo A-6: East Wall – Overall

Control joint at north end needs to be resealed.

Chipped brick at the lower north wall needs replacing.
The metal louver and door at the north end need repainting.

North: The drainage pipe at the east and west ends need rerouting. Water weeps out of the pipe and gathers in a puddle at base of the wall.
Steel downspout enclosures are in good condition but need repainting.
The metal overhead door and steel angle door jambs need repainting.
Both masonry jambs of the overhead dock door are cracked due to hits by vehicles. The west jamb is more severely cracked; the masonry must be replaced. The east jamb is cracked and can be repaired.
The bottom 2 courses of brick are structurally sound but are discolored and need cleaning with mildewcide.
A gravel strip next to the building is required for positive drainage.
The door and metal louver need repainting.
Chipped brick at the gate to the electric transformer enclosure needs replacing.
The lowest mortar joint coincides with the existing grade level. In a heavy rain this leads to flooding of ground water in the interior of the ice rink. The ground level should be re-graded to drain away from the building.

Photo A-7: North – Overall Elevation

Photo A-8: North – Downspout Detail

Photo A-9: West Overhead Door Jamb

VISUAL OBSERVATIONS **ROOM FINISH CONDITIONS SURVEY**

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
A101	Vestibule	Metal Slat	Brick Base Rubber Tile Floor	Painted Block	Walls - good condition; recently painted Metal and glass doors need repainting Floor – worn, delaminating
A102	Community Center Corridor	Metal Slat	Vinyl Tile Brick Base	Painted Block	Walls - good condition Ceiling - good condition Floor - good condition
A103	Multipurpose Room A/B	Acoustical Tile	Vinyl Tile	Painted Block	North, East & West Walls - good condition South Wall – cracked at east end; large repaired crack Floor needs replacing - southeast corner of room Ceiling tile needs replacing; acoustical tile dented and water damaged
A104	Storage	None Exposed	Vinyl Tile	Unfinished Block	Walls – good condition Vinyl tile needs replacing Ceiling – needs painting
A105	Kitchen	Painted Plaster	Vinyl Tile Vinyl Base	Painted Block	Walls – good condition Floor needs replacing
A106	Craft Room “C”	Exposed	Brick Base Exposed Concrete Floor	Painted Block	Walls – good condition Some evidence of water penetration Skylight needs replacing – see Roofing Section for detailed skylight comments
A107	Kiln	Exposed Structure	Brick Base Exposed Concrete Floor	Painted Block	Walls – good condition Floor – good condition Modify door and flue, add exhaust fan. See Architectural and Mechanical Cost Estimate

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
A108	Storage	Exposed Structure	Brick Base Exposed Concrete Floor	Painted Block	Walls – good condition Loose exhaust fan mount on South wall
A109	Gym	Exposed Steel – Painted	Brick Base Floor – Composition Gymnasium Rubber	Painted Block	Block – good condition Wall needs repainting Hollow metal doors & frames need repainting Ductwork needs cleaning & repainting Floor - Bubble in floor adjacent to East wall, in center of floor and near goals. Bubbles due to periodic penetration of water from exterior drain at east side of door.
A110	Office	Acoustical Tile	Brick Base Rubber Skate Floor	Painted Block	Block – good condition Ceiling tile damaged Floor - delaminating
A111	Storage	Exposed Not Painted	South Wall – Brick Base Other Walls – Painted Block Vinyl Asbestos Tile	Painted Block	Doors and all walls need repainting
A112 A114 A115	Men's Locker Toilet Shower	Portland Cement Plaster	Vinyl Sheet Flooring	Painted Block	Walls - generally good condition Floor – poor shape, needs replacement – peeling & split in all areas Non-adhesion of vinyl floor to concrete slab floor - vinyl base o.k. Lavatory counter laminate is delaminating. Toilet fixtures o.k. Lockers – generally good condition; about 10 lockers need refurbishing and new hardware Toilet partitions dented, need replacing Replace scratched benches

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
A113	Storage	Plaster	Painted Block Vinyl Asbestos Tile	Painted Block	Block – good condition
A116 & 117	Women's Room & Locker Room	Plaster	Vinyl Base Sheet Vinyl Floor	Painted Block	Concrete Block – good condition Floors in poor condition - sheet vinyl bubbled & peeling up Toilet Partition – poor condition; missing hardware, rusted – needs replacing Showers – terrazzo base – good condition Lockers – dented & scratched – need refinishing and/or replacing Plywood Laminate Counter – peeling needs replacing
A118	Janitor Closet	Plaster	Vinyl Asbestos Tile Floor Vinyl Base	Painted Block	Walls – good condition Floor & base need replacing
A119	Room D	Acoustical Tile	Brick Base Vinyl Asbestos Tile	Painted Block	Block – good condition Ceiling – good condition Closet doors deteriorated – missing hardware Hollow metal doors & frames need painting
A120	Concession	Metal Slat	Vinyl Asbestos Tile Brick/Vinyl Base	Painted Block & Rolling Grills	Walls & grilling – good condition Ceiling – good condition All cabinetry requires replacing; cabinetry base deteriorated Vinyl base needs replacing
A121	Storage	Acoustical Tile with Chicken Wire	Vinyl Asbestos Tile Brick Base	Painted Block	Walls - good condition Floor - needs replacing

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
A122	Storage (eliminated)				
A123	Toilet (eliminated)				Non-existent - Nursery Room A119 expanded to take over space of A122 & A123 and remaining room made into closet.
A124	Dance Studio Room E	Acoustical Tile	Brick Base Vinyl Asbestos Tile	Gypsum Board & Mirror	Concrete block – good condition
A125	Office	Acoustical Tile	Vinyl Asbestos Tile Floor Brick Base	Painted Block	Walls – good condition Ceiling – good condition
A126	Staff Storage Area	Acoustical Tile	Brick Base Carpeted Floor	Painted Block	Walls – no ticket window (shown in original plans) Room used for skate changing and storage Carpet needs replacing – torn & buckled - currently underway Ceiling – holes in acoustical tile; needs replacing
A127	Office	Acoustical Tile	Vinyl Asbestos Tile Floor Brick Base	Painted Block	Walls – good condition Floor – good condition Ceiling – acoustical tiles need replacing
A128	Office	Acoustical Tile	Vinyl Asbestos Tile Floor Brick Base	Painted Block	Walls – good condition Floor – good condition Ceiling – acoustical tiles water damaged; need replacing
A129	Toilet	Acoustical Tile	Brick Base Rubber Skate Tile	Painted Block	Walls – good condition Floor – worn, delaminating Ceiling – good condition
A130	Toilet	Acoustical Tile	Brick Base Rubber Skate Tile	Painted Block	Walls – good condition Floor – worn, delaminating Ceiling – good condition

ROOM#	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
A131	Skate Sharpening	Acoustical Tile	Carpet Floor Brick Base	Painted Block	Walls – good condition Floor – carpet needs replacing Ceiling – acoustical tiles needs replacing
A132	Skates	Acoustical Tile	Carpet Floor Brick Base	Painted Block & Rolling Grills	Walls – block in good condition; moderate damage to grill; cabinetry is deteriorated – needs replacing. Ceiling -Extensive leaking over Room A132 area – water damage to ceiling Floor - Carpet is buckled & torn - currently being replaced
A133	Lobby	Skylight	Rubber Skate Tile Brick Base	Block	East Wall – Under skylight sill has horizontal crack North Wall – Exposed masonry brick – good condition Lockers on North wall need repainting Generally, walls in good condition Ceiling – skylight exhibits various leaks; sealant deteriorating & condensation on glazing (see Roofing Section for skylight survey) Floor – worn, delaminating
A134	Concourse	Metal Slat	Rubber Skate Tile Brick Base`	Painted Block Masonry Brick	North Wall – exposed masonry brick – good condition South Wall – painted block – good condition Ceiling – 5% of the ceiling needs replacing – bent slats Floor – worn, delaminating
B101	Equipment Storage Room	Exposed Structure	Rubber Skate Brick Base	Painted Block	West Wall – vertical cracks Concrete block is spawling at northwest and southeast corners of the room Currently there is a steel framed storage mezzanine on the West side of the room. Room is currently used for storage and as a workshop. Mezzanine is approx 250 s.f. Floor – worn

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
B102	Women's Room	Plaster	Rubber Skate Brick Base	Painted Block	Room currently used as boiler room. Floor – water damaged; needs replacement Ceiling – some water damage
B103	Men's Room	Plaster	Rubber Skate Brick Base	Painted Block	Walls – good condition Ceiling – good condition Floor – worn, delaminating
B104	Mechanical	Exposed Structure	Concrete Base & Floor	Exposed Unpainted Concrete Block	Walls – no cracks apparent Floor – water stains, chemical stains
B105	Surfacer Room	Exposed Structure	Exposed Concrete	Unpainted Concrete Block	Walls – no cracks are obvious. The North wall adjacent to the ice pit has water damage due to humidity level. Organic growth possibilities ought to be investigated further. Floor – Standing water at ice pit; cracks in concrete slab
B106	Skating Rink	Exposed with reflective fabric hanging below joists	Skate Tile Floor Masonry Base Floor - worn	Painted Concrete Block	Ceiling – fabric may be for insulation but also for light reflecting down lights. North Wall - During rain, water weeps through north foundation concrete wall. This foundation wall is below grade. Painted CMU – needs repainting; CMU appears in good condition. Concrete foundation base painted. West Wall – Painted CMU – water ponding on floor at overhead door. Overhead door needs replacing, dented. CMU good condition. South Wall – Vertical crack in CMU wall at expansion joint at westernmost roof joist. This was created by joist movement due to lateral wind loads. See Structural Report Phase II for further explanation.

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
B107	Referee	Plaster	Rubber Skate Tile	Painted Block	Currently used for concession storage – good condition Ceiling – good condition
B108	Storage	Exposed Concrete	Exposed Concrete	Painted Block and Exposed Concrete	West side of B108 used for props for ice show Walls - good condition. Need cleaning and painting with fungicide Floor - good condition
B109	Team Room	Painted Concrete	Rubber Skate Tile Brick Base	Painted Block	Wing wall has chipped blocks – need to replace 3 blocks. Ceiling – good condition Floor – worn and delaminating – needs replacement
B110	Shower	Painted Concrete	Exposed Concrete Slab	Painted Block	Walls/Ceiling – good condition
B111	Toilet	Painted Concrete	Rubber Skate Tile Brick Base	Painted Block	Walls – good condition Floor – delaminating
B112	Team Room	Painted Concrete	Rubber Skate Brick Base	Painted Block	Walls – good condition Floor – delaminating
B113	Women's Room	Painted Concrete	Rubber Skate Tile Brick Base	Painted Block	Toilet partitions are chipped & delaminating – need replacing. Sink fascia has graffiti – needs replacing Floor is worn Ceiling – peeling paint
B114	Storage	Exposed Concrete	Exposed Concrete	Painted Block Exposed Concrete & Grandstand	Walls – good condition - needs painting and cleaning with fungicide Floor - good condition
B115	Maintenance Closet	Unpainted Concrete	Exposed Concrete Slab Brick Base	Unpainted Concrete Block	Area used for janitor's closet and electrical panel room
B116	Instruction	Painted Concrete	Rubber Skate Tile Brick Base	Painted Block	Walls - good condition Floor - good condition Area currently used for storage

ROOM#	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
B117	Men's Room	Painted Concrete	Rubber Skate Tile Brick Base	Painted Block	Walls – good condition Floor – delaminating; needs replacement Toilet fixtures o.k. Toilet partitions delaminated, chipped – need replacing Sink, countertop o.k. Front rail needs replacing Ceiling – needs painting
B118	Team Room	Exposed Concrete, Painted	Rubber Skate Tile Brick Base	Painted Concrete Block	Walls – generally good condition. Wing wall at East end of room is chipped – needs replacing Floor – delaminating Ceiling – needs painting
B119	Shower	Painted Concrete	Exposed Concrete	Painted Block	Walls – good condition Floor – cracked slab Ceiling – good condition, painting required
B120	Toilet	Painted Concrete	Rubber Skate Tile Brick Base	Painted Concrete Block	Walls – good condition; louver in East wall needs replacing Hollow metal doors bent – need replacing Floor – Standing water, delaminating Ceiling – good condition, needs painting
B121	Team Room	Painted Concrete	Rubber Skate Floor Brick Base	Painted Block	Walls – good condition; metal louver in East wall needs replacing Floor – some standing water; delaminating Ceiling – good condition, needs painting
B122	Storage	Exposed Concrete	Exposed Concrete	Painted Block & Grandstand	Walls – good condition Floor – good condition Ceiling – good condition, needs painting and cleaning with fungicide
B123	First Aid	Plaster	Rubber Skate Tile	Painted Block	Good condition Ceiling – needs painting

ROOM #	ROOM NAME	CEILING	FLOOR & BASE	WALLS	COMMENTS
B124	Studio Rink	Exposed Structure with reflective fabric suspended below joists	Rubber Skate Tile	Painted Concrete Block	Walls – South wall exhibits vertical cracks. Louver in Southwest corner needs replacing. Possible mold growth on East block wall. Other block walls in good condition. Ceiling – metal ceiling over vestibule needs repainting Suspended fabric exhibits deterioration. Floor – tile delaminating from concrete floor, needs replacement
B125	Mechanical				On roof
B126	Bleachers	Painted Exposed Steel	Exposed Poured Concrete Slab		Bleacher seats are fiberglass. Benches exhibit a tremendous amount of cracks, warping, bending and deterioration. Many have been spliced together by the maintenance staff.
B127	Control Room	Plaster	Exposed Concrete	Painted Block	Walls – cracked block on South wall Floor – good condition Ceiling – good condition, needs painting

Architecture - Research

Building Code Analysis – 1996 BOCA

Occupancy Classification:

Group A-3: Ice Rinks and gymnasium
This use group shall include all buildings with or without an auditorium in which persons assemble for…. recreation purposes.

Group E: A space which accommodates more than 5 persons used for educational purposes….shall be Group E.

Exception: a space which is occupied by less than 50 people of age 5 or more, which is accessory to another use group shall be classified as part of the main use.

Day Care Facilities: a day care facility which provides care for more than 5 persons 2 ½ years of age or more for less than 24 hours/day shall be Use Group E.

Group I-2
Child Care Facility: A Child Care facility which accommodates more than 5 children 2 ½ years of age or less for any length of time shall be classified as Use Group I-2.

The educational (Use Group E) and Day Care (Use Group I-2) areas of the Robert Crown Center consists of rooms A103, A106, A119 and A124. The aggregate area of these rooms (3,851 s.f.) is less than 10% of the total area of the building (approx. 61,000 s.f.). In addition, the Group E area (1,221 s.f.) is less than 10% of the area permitted for a Group E use outlined in Table 503. The permitted area for use Group E in a Type 2C building is 64,800 s.f. (taking perimeter and sprinklering credits). As long as the Group E use remains an accessory use to the main use (A-3) of the building, the provisions for direct outdoor exits from each classroom would not apply (BOCA 507.1.1). This interpretation is from BOCA headquarters in Country Club Hills. As soon as the area of the

Group E use grows beyond the definition of an accessory use, then 507.1.1 would apply and individual exits from each room directly to the outside would be required. Similarly, the I-2 use can be defined as an accessory use to the main use of the building. The total I-2 area is 2,630 s.f. This is less than 10% of the area allowed for an I2 occupancy in a Type 2C building which is 32,400 s.f. (taking the sprinklering and perimeter credits). In any case, the I-2 use is a permitted use within the unlimited area provision of the code (507.1). Therefore the Group E and Group I-2 Child Care facility educational use is an accessory area to the main use group of the building (A-3 recreational) BOCA 302.1.2.

Height and Area Parameters

To meet the requirements of the building code currently enforced in Evanston (BOCA 1996), the building must be classified under the unlimited area provision of the code (BOCA 507.1). This is because the current area of the building (61,000 s.f.) exceeds the allowable area for a Type 2C building with occupancy A-3 (37,800 allowable). The building is of Type 2 construction (unprotected non-combustible) and houses as a main Use Group A-3. A one story building containing A3, of Type 2 construction is permitted to be of unlimited area if it has an automatic sprinkler system throughout.

An exception for the requirement of a sprinkler system is permitted for the area directly over the ice rinks and the gym. These are called indoor participant sport areas (BOCA 507.1[4]). To qualify for this exemption, the building must be equipped with a fire alarm system with manual pull stations. In addition, exit doors must lead directly from the participant sport areas to the outside (BOCA 507.1[4.1] and 507.1[4.2]).

Sprinklering

The building as currently constructed does not have sprinkler systems in a number of occupied spaces. This includes the main concourse, entry vestibule, bathrooms, gymnasium, ice rinks, and other spaces in the building as outlined in the Fire Protection Section of this report. To comply with the current building code, all areas of the building, including the seating area of the main ice rink, must be sprinklered. The code does allow a possible exemption from requiring the ice rinks and gymnasium to be sprinklered (called "participant sport areas").

However, the reason that the building, as currently designed, does not qualify for the sprinklering exemption stated above are two-fold:

1. The gymnasium does not have enough exit capacity leading directly to the exterior of the building. The studio rink does not have any exit leading directly to the exterior. The main ice rink also does not have enough exit capacity leading directly to the exterior.

2. In a building which has non-separated mixed uses, the most stringent code requirement for the most restrictive use must apply to the entire building.

In order to construct a Type 2 building of unlimited area, the code states that the building must be fully sprinklered throughout the entire building. Since this is a mixed-use building, the requirements to sprinkler the I-2 and non-recreational A-3 uses, must apply throughout the whole building.

DCFS Requirements

There are currently two licensed Day Care rooms in the Robert Crown Center and the City is seeking a license for a third room.

On a functional basis, these rooms are far from ideal in that they lack natural ventilation, natural light, direct outdoor access, adjacent play

ground, and child bathrooms directly adjacent to the classrooms. The rooms also lack adequate storage for required classroom materials.

However, the Department of Children and Family Services (DCFS), has granted a Day Care Operating License to two rooms with the following caveats:

1. A third sink must be provided in the kitchen area.
2. The entry doors to corridor A102 must be equipped with a security buzzer to control access to the Community Center.
3. Adequate storage must be provided for DCFS required learning materials.

These items remain to be completed.

Exiting Requirements (BOCA 1996)

The analysis of exit corridor widths, number of doors, door widths, and door locations were based on the occupancy calculations (number of occupants in the building) reflected in the following chart. The exiting calculations were based on simultaneous occupancy of the building for grandstands, all building spaces occupied, and the lobby and concourse occupied at 3 s.f./person. The gymnasium was calculated as an assembly space at 15 s.f./person (tables and chairs).

The simultaneous occupancy of the building is theoretically 3,347 people. Although this seems extremely high and unlikely, it is the most conservative case and was therefore utilized for calculating the adequacy of means of egress components in the existing building.

In the event of any future remodeling, the City of Evanston building code officials will make the final judgment as to the validity of these occupancy calculation assumptions before alternative plans are finalized or implemented.

I. Building Exits

A. Main Entrance/Exit (1006.2.2)

The 1996 BOCA Code states: "Where there is a single main entrance, the entrance shall be capable of serving as the main exit and shall provide an egress capacity for at least one-half of the total occupant load".

Occupant Load:

$$\frac{3{,}547 \text{ people}}{2} = 1{,}773 \text{ people}$$

1,773 people x .15"/person (Table 1009.2) = 22.16 ft. of exit width required at main entrance.

Eight 3'-0" (nominal) existing exit doors are located at the main entrance. 8 (3'-0") = 24 ft. Main entrance meets code requirements.

B. Egress Widths at All Other Exits

The same section states that "In addition to having access to the main exit, each level of an occupancy in use Group A shall be provided with additional exits which shall provide a means of egress capacity for at least one-half of the total occupant load served by that level".

That would require an additional eight 3'-0" wide exit doors for an additional total of 24 ft. of exit width to serve the additional 1,773 people. The existing building only has 7 additional publicly accessible exit doors. One additional door is required, most likely an exit from the main rink area or the east end of Concourse A-134, or an additional exit door at the main entrance to the building.

C. Building Exits from Interior Public Exitways

The total occupant load of the main public exitways of the building (Concourse A-134, Lobby A-133, Corridor A-102, Vestibule A-101) is 3,022 people. This number includes the proportional occupant load of all the rooms or spaces which discharge through these exitways, added to the occupant load of the exitway spaces themselves.

Utilizing Table 1009.2: 3,022 people x .15"/person = 37.7 ft. of total exit width required. This would be equivalent to (13) 3'-0" wide exit doors. Currently there are only 12 exit doors discharging directly to the exterior. One more 3'-0" wide door is required. A possible location is at the east end of Concourse A-134. This would also satisfy the requirement for an additional door stated in Item B above.

D. Corridor A-102

Another area of required attention in regard to building exits from exit accessways is Corridor A-102. Corridor A-102 must lead to a means of egress element at each end of the corridor. Otherwise it is a dead-end corridor, which under the code is allowed to be a maximum of 20 feet in length (BOCA 1011.2). Corridor A-102 would far exceed that requirement. The code states that "corridors…shall provide direct connection to exits in opposite directions from any point in the corridor". Therefore, at its east end, Corridor A102 must exit through the gym. (This is permitted by BOCA 1006.2.1)

E. Gym Exits

Presently, there are 2 exits from the gymnasium to exit accessways or leading directly to the exterior. One exit leads directly to the exterior and one exit to Corridor A-102. The occupant load for the gym was calculated at 15 s.f./person which is an assembly use with tables and chairs. The gym could conceivably be used for such a social event. Adding together the proportional exit discharge loads from the locker rooms, and the gym itself, the total occupant load in the gym is 441 people. Proportional exit calculations would result in one-third (147 people) utilizing the east exit door. Adding the 125 people exiting from Corridor A-102 through the gym to the east door, results in a discharge load of 272 people through the east door.

272 people x .15"/person = 3.4 ft. wide door required. Currently there is only one 3'-0" wide exit door on the east side of the gym. A larger door, a pair of doors, or an additional door is required.

II. Corridor Widths

A. Concourse A-134

The occupant load of Concourse A-134 is 2,425 people/3 exits. This consists of occupants which would proportionally exit from habitable spaces and rooms into the concourse, and occupants of the concourse itself.

The corridor capacity is dictated by BOCA 1011.3.1 which states that the required capacity of the corridor shall be determined by dividing the occupant load that uses the corridor for exit access by the number of exits to which the corridor connects.

In the case of the concourse we have 2,425 people/3 exits = 808 people capacity (3 exits). 808 people x .15"/person = 10 ft. wide corridor. The existing corridor is 11 ft. wide at its narrowest and 20 ft wide at its maximum width. The existing concourse width complies with the code.

B. Corridor A-102

The occupant capacity of Corridor A-102 is calculated as follows: 544 people/2 exits = 272 people exit capacity. 272 people x .15"/person = 3.4 ft. width required. The minimum width in this case is 6 ft (BOCA 1011.3). The egress doors at the west end of the corridor meet the six foot minimum requirement. The exiting corridor width is 8 ft. Corridor A-102 complies with the code for exit capacity.

C. Lobby A-133

The proportional occupant exiting load from the concourse to the lobby space is 1,483 people. The occupant load of contributing spaces adjacent to the lobby, including the lobby itself, is 356.

The total occupant load is 1,839 people. 1839 people/2 exits = 919 people exit capacity. 919 x .15"/person = 11.5 ft.

exit width required. The width of the existing lobby is 14 ft. The existing lobby complies with code for corridor width for this requirement. The vestibule exit doors also comply.

However, this provision of the Code (1011.3.1) also states that "The corridor width shall not be less than the required capacity of the exit elements to which the corridor leads". In this case, Section 1006.2.2 required that the main entrance to the building be able to accommodate one-half of the occupant load in terms of exit capacity of the entire building. We have previously established that figure at 22.16 feet of exit width. If 22.16 feet is the required exit width at the main entrance, and the corridor leading to it cannot be less than that capacity, then the lobby width should be 22.16 feet also. The existing lobby width is 14 ft. The exit doors at the vestibule provide only 12 ft. of egress width capacity which effectively further limits access to the main entrance/exit doors.

An argument could be made that the combined width of Corridor A-102 and Lobby A-133 should be considered for meeting this requirement. If we took the sum of the widths of A-102 (8 ft.) and A-133 (14 ft.), the result would be 22 ft. This marginally satisfies the 22.16 ft. requirement. However, the exit doors at Corridor A-102 (6 ft.) and Lobby A-133 (12 ft.) only provide a total of 18 ft. of exit width, far short of the 22.16 required. The existing vestibule door and day care entry door arrangements do not meet the exiting requirement of this provision of the code.

Occupancy Calculations

The number of occupants in the Robert Crown Center was calculated according to Table 1008.1.2 in the 1996 BOCA Building Code.

Due to the fact that this facility is a mixed-use building, the occupancy count for each space was considered on an individual basis according to the categories listed in the table.

The exception to the above statement is the gymnasium and ice rinks. There are no specific categories for these uses in Table 1008.1.2. Upon consultations with BOCA officials at the Country Club Hills Headquarters, we calculated the occupancy of the gym and ice rinks at 50 s.f./person. The 2000 International Building Code (Table 1003.2.2.2) lists these uses at 50 s.f./person. According to BOCA officials, the BOCA code is headed in this direction and it was their recommendation to use those figures.

The calculations were divided into two categories. The first set of occupancy calculations were performed to determine the plumbing fixture count. These are based on the Table 1008.1.2, for a "reasonable" degree of "simultaneous" occupancy. Simultaneous occupancy is the condition in which all spaces in the building are fully occupied at the same time. The Crown Center, when fully occupied, can reasonably accommodate 975 people (see chart on following page). This does not include the grandstands in the main ice rink which can accommodate an additional 1,028 people.

The reasonable occupancy of the building is approximately 1,000 to 1,100 people. It is assumed that at the time a show is in progress and the grandstand is fully occupied, the building is not also fully occupied. Otherwise, we would be calculating the plumbing fixture count on the basis of more than 2,000 people, which would be an extremely remote possibility and an unreasonable assumption. The above assumptions were utilized in calculating

occupancy only for plumbing fixture counts.

On the other hand, unlike plumbing fixture counts which are not a life-safety issue, the occupancy calculations for exiting purposes were based on simultaneous occupancy of the grandstands and the building fully occupied, and the lobby and concourse also fully occupied at the most intense allowable assembly usage (3 s.f./person). It also calculates the occupancy of the gym at 15 s.f./person for a table and chair configuration. Although this is an unlikely probability, the remote possibility for this intense occupancy exists. Since this is a life-safety issue, exiting calculations were based on occupancy calculations reflecting this intensive state of usage (see chart on following pages).

Occupancy Chart for Plumbing Fixture Calculations

Space	S.F.	S.F./Person	Number of Occupants
Washrooms/Lockers			
A-112 thru A-117	1549	100	16
Washrooms B-113 & B-117	1092	100	11
Offices/Skate Rental/Lobby			
A-125, A-101, A-133, A-126 thru A-132	2024	100	21
Classroom			
Corridor A-102	840	100	9
Dance Studio A-124	442	20	22
Kitchen, Storage A-104, A-108, A-105	396	300	2
Concession A-120	215	100	3
Game Room A-119	954	20	48
Multipurpose Room A/B A-103	1764	20	88
Craft Room A-106	1688	100	17
Kiln A-107	80	100	1
Gym A-109	5984	50	119
Concourse A-134	4267	100	43
Storage A-111, B-108, B-114, B-122	1595	300	6
Team Rooms B-109 thru B-112 B-118 thru B-121	1292	100	13
Referee/First Aid B-107 & B-123	144	100	2
Studio Rink B-124	5737	50	115
Surfacer Room B-105	769	300	3
Warming Room B-101	744	300	3
Mechanical Room B-104	814	300	3
Total Without Rink			*545*
Main Skating Rink B-106	21,455	50	430
Space	**S.F.**	**S.F./Person**	**Number of Occupants**
Total Occupancy: If the building were reasonably fully occupied on a typical day, by code.			*975*
Grandstand: 1,008 people per BOCA 1008.1.6 and 20 accessible seats per Illinois Accessibility Code Section 400.320, Subsection a) 1A) p. 73			1,028

Occupancy by Category: Summary for Plumbing Fixture Calculations

Recreational Uses:		Mechanical/Storage:	
	Team		
Rooms	13 people	Surfacer Room	3 people
Ice Rink	430 people	Storage/Kitchen	2 people
Studio Rink	115 people	Warming Room/Storage	3 people
Gym	119 people	Mechanical Room	3 people
Concourse	43 people	Storage	6 people
Concession	3 people		
Referee/First Aid	2 people	Total	17 people
Total	725 people		
Classroom Educational Uses:		**Offices:**	
Washrooms	27 people	Lobby, Office, Skate Rental	21 people
Corridor	9 people		
Dance Studio	22 people	Total	21 people
Game Room	48 people		
Multipurpose Room	88 people		
Craft Room	17 people		
Kiln	1 person		
		Summary Total	975 people
Total	212 people		

Occupancy Chart for Exiting Calculations

Space	Room	S.F.	S.F./Person	Number of Occupants
Vestibule	A-101	336	3	112
Corridor	A-102	840	20	42
Multipurpose A/B	A-103	1,764	20	88
Craft Room	A-106	1,688	23	73
Gym	A-109	5,730	15	382
Office	A-110	120	100	2
Lockers/Washroom	A-112 - A-115	----	Based on Actual Number of Lockers & Toilet Fixtures	78
Lockers/Washroom	A-116 – A118	----	Same as Above	38
Game Room	A-119	954	20	48
Concession	A-120	215	100	3
Storage	A-121, A-122	----	300	2
Dance Studio	A-129	440	20	22
Office	A-125	163	100	2
Office	A-126 – A-132	1,100	75	15
Lobby	A-133	700	3	233
Concourse	A-134	4,267	6.5 average combination of 3 s.f./person and 15 s.f./person in fixed seating areas of concourse	650
Warming Room	B-101	744	300	3
Mechanical Room	B-104	814	300	3
Surfacer Room	B-105	769	300	3
Main Rink	B-106	21,455	50	430
Referee & First Aid	B-107 & B-123	144	100	2
Storage	B-108, B-114, B-122	1,256	300	6
Team Rooms	B-109, B-110, B-111, B-112	----	Based on actual bench length at 18"/person	75
Women's Room	B-113	----	Based on number of plumbing fixtures	6
Men's Room	B-117	----	Based on number of plumbing fixtures	6
Instructor	B-116	215	100	3
Staff Room	B-115	215	100	3
Team Rooms	B-118, B-119, B-120, B-121	----	Based on actual bench Length at 18"/person	75
Studio Rink	B-124	5,737	50	115
Grandstand	----	----	18" of bench length/person BOCA 1008.1.6	1,028 (Including 20 HCP positions)

Total Occupancy for Exiting Calculations 3,548 people

Architecture - Interview : Physical Building Analysis

Participants: Stefanie Levine, Robert Lloyd, Bob Dorneker and Andrew Metter

Date: July 15, 2002
By Andrew Metter

HVAC
Heating

1. The original design used excess heat from the ice condensers heating water. The boiler also provided heating water. There is a mixing valve which permits switching from one system to the other. The electric boiler was replaced with a gas fired boiler. The mixing valve is used for heat for sub-floor heating in the ice rink and the ice melting pit.
2. There is no header wall above the main entry vestibule inner doors, and the cold wind blows in above the ceiling and comes out at the service counter and office.
3. The gym is the warmest space because it has its own hot air gas fired furnace. It also provides heat to the Arts and Crafts Room.
4. Boiler water can be used to melt the ice from resurfacing; this lowers the temperature in the boiler loop and makes it difficult to heat the building.
5. The temperature environment in the main rink is adequate but there is no air circulation at the higher levels along the north wall. The players' bench area is very stagnant. Because of lack of air movement there is some mold growth at the top of the north wall.
6. It was suggested that a combination exhaust fan and relief vents might temper the area over the bleacher seats and the stagnant north area at the same time.
7. The mechanical system is partially run through an Andover control system. The exhaust fans operate in some spaces only

when the lights are on. The system was installed in 1986 but the software has been recently upgraded.

8. Acoustics in the facility is not a problem.
9. Area under the lobby skylight gets hot, especially in summer.
10. They have a hard time controlling the humidity level in the studio rink. The pit for the ice resurfacing is near the studio rink area. The west wall appears to grow mold. A full building survey by a certified mold abatement and remediation consultant should be pursued by the City. There is also a return air vent that is located close to the pit. It picks up moisture from the pit and might need to be relocated. The wall should be tested for mold growth by a certified lab. On occasion, the door to the resurfacing room is left open raising the humidity level in the studio rink. The door should be dept closed.
11. Heating and cooling in locker rooms is ok.
12. Ventilation in men's bathroom is very poor.
13. The combustion air for the boiler in the winter freezes pipes in the boiler room.

Electrical

1. Service Room – There used to be one switch to turn on lights; now they have to flip individual breakers. They would like to go back to a central control switch.
2. Studio Rink – Lights are controlled by a switch in the northwest corner of the room. During cold weather, the lights flash intermittently. There is no heat at that location in the room. They feel that it is affecting the electrical system.
3. The kiln room in the Crafts Room (A-107) requires a 2 hour rated door and a lined, rated flue with an induction fan. They do not currently comply with code.
4. Lighting in lockers, lobby, concourse is too low; very dark both day time and evening. Additional lights are needed in these spaces.
5. Parking lot lighting fixtures are rusting and need replacement. According to staff, need to pull new wiring to west parking lot light

fixtures. They had work done a couple of years ago and the electrician stated that the wires were deteriorated. Analyze parking lot lighting levels and comment on fixture location. The lighting levels are adequate based on an analysis of the number of fixtures, heads per pole, fixture spacing, and size of the lot. The electrical recommendations in the Phase II Report calls for wiring and fixture replacement in the same locations.

Plumbing

1. Analyze toilet fixture counts according to current code. Architect needs to provide occupancy levels (1000 capacity in grandstands).
2. Backflow preventer on drainage in parking lot gets plugged up and sewage backs up into building during heavy rain.
3. There is a drain tile system and sump pump according to staff. Moisture under gym floor is a problem. Drain tile possibly broken under gym floor. Investigation required.
4. West parking lot was originally designed as a rainwater detention area. During heavy rains, water overflows both lots and cascades down to the building. Some kind of trench drains and/or pumps or improved detention or underground boxes or any combination needs to be designed to prevent this from occurring.

Architecture - Interview: Day Care Program Analysis

Participants: Andrew Metter
Donna Kent

Date: July 16, 2002
By: Andrew Metter

- Robert Crown currently runs a day care program for two to three-year old children.
- The day care program for two to three-year olds is the one that is currently licensed by DCFS of the State of Illinois.
- The rooms which are currently licensed are the Room C (Room A106) and the Room A/B (A103). The Game Room (A119) is currently exempt due to its use of less than 10 hours per group per week. If the Robert Crown staff requires more hours of usage, then a license for Room A119 would be required.
- There is enough demand for the pre-school program in the community to justify two more licensed rooms.
- The number of children in the two-year old program is 16 at one time in the craft room.
- The multipurpose room is licensed for 18 children at one time.
- The children are not at the facility for the entire day. To run a day-long program, separate sinks, refrigerator, cots and cot storage would be required by DCFS.
- The day care children currently use the Washington School yard playground and play equipment, as Robert Crown does not have any playground equipment.
- A pre-school program for three to five-year olds is desired. The program is currently not licensed for this age group.
- The Department of Children and Family Services (DCFS) has listed three items which require attention to maintain the day care license. These are:

    1. The Men's Toilet Room (Room A114), used by the children, is required to be

locked from the gymnasium side during program hours of operation.

2. A security buzzer is required at the main vestibule entrance area to prevent unmonitored access to the Community Center.

3. A third sink is required in the kitchen area.

The above work has yet to be performed.

Architecture - Interview: Functional Program Analysis

Participants: Nanci Fragassi, Robert Lloyd, Sheila Lonergan, George Dotson

Date: September 12, 2002
By: Andrew Metter

The purpose of this interview was to establish operational deficiencies at the Robert Crown Center in relation to current programs conducted within the facility.

Gymnasium

The gymnasium is a very heavily used space programmatically. It is currently used for art, dance, karate, summer camp, 4th & 5th grade basketball, adult basketball and birthday parties.

Basketball hoops and backboards should be adjustable in height to accommodate the various user age groups. They are currently fixed in place.

The gymnasium along with the ice rink is one of the most heavily utilized spaces in the building.

The Robert Crown Day Program, Robert Crown Day Camp and Hockey Camp are all program activities vying for virtually simultaneous use of the gym. In addition, during program activities, there is no place for parents and other spectators to observe the children at play. The parents crowd the sidelines and ultimately interfere with the ongoing activities. Bleachers on the east side of the building would be required to address this problem. The staff estimated that a 250 seat bleacher set-up would be adequate to accommodate spectators for a majority of the events.

Increased storage area for the gym is also required. Essentially, this area needs to be doubled. The existing storage area contains

gymnastic equipment, tricycles for the pre-school program, yoga mats, aerobic steps, and equipment for day camp (230 children) and hockey camp (40 children). The floor in the gymnasium shows some signs of bubbling. In the past rain water has penetrated and partially flooded the gym through the east side exterior door. This is due to the inadequate size of the subsoil drainage system. Theoretically, with the addition of a detention basin west of the building, this condition will be alleviated.

The gymnasium also requires its own locker and bathroom facilities. Currently, the bathroom and locker rooms are shared with the pre-school program. The Department of Children and Family Services (DCFS) requires that during the hours of operation of the pre-school facility, the bathroom/locker room must be locked from the gymnasium side in order to guarantee the safety of the children. Clearly, additional facilities are required in order to maintain a functional and secure program environment.

Photo A-10: Broken Bleacher Seats

Fitness Room

A fitness room is desired for figure skating and hockey players. This would essentially be a modest size training room with resistance machines and free weights. This is seen as a desirable feature to complement the current skating programs.

Crafts Facilities

Currently, the craft facilities are confined to Room A106. This room, originally designed as a 1400 s.f. space has been divided into three spaces by wire mesh partitions. There is a craft area, a pottery/ceramics area, and a space devoted to storage of costumes and props for ice shows. Due to the subsequent sub-division of the space, each area is inadequate for its current use. At the present time, there are sewing classes and camp classes that are being conducted in the ice show storage area. Clearly, a separate area for ice show costume storage is required and the current program

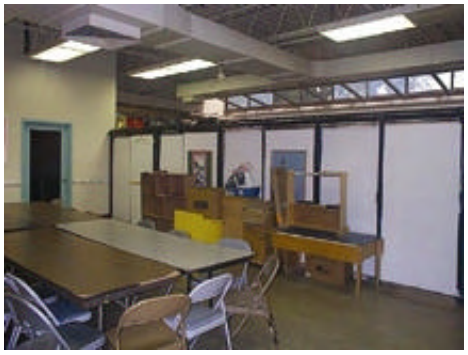


Photo A-11: Craft Room

load can support two additional rooms for craft activities.

Photo A-12: Main Corridor to Gym

Multipurpose Room

There is currently one multipurpose room of approximately 1600 s.f. It is located adjacent to the main entry to the building and is capable of being divided into two equal spaces by a moveable partition. There is a kitchen adjacent to the east side of the room. The windowless room has no natural light. This room is used for a number of activities, but most heavily for the pre-school program. A number of dance classes are also held in this room. A new synthetic floor would be desirable for dance.

The staff stated that the current program load would justify an additional multipurpose room, preferably set up to accommodate dance classes. This additional room would also provide space to conduct current yoga classes.

Skate Park

The skate park was very popular when it was first introduced as an outdoor program at Robert Crown. The staff stated that popularity of the skate park has declined over the past years. The Center is also paying personnel to supervise the park during program hours of operation. This tends to be expensive and labor intensive to operate.

Security is a major concern with the park. Staff feel that after hours the park tends to be a place for unsupervised teens to congregate, especially at night. Currently there is no fence around the skate park area. The staff felt that this area needs to be secured.

Studio Rink

The studio rink is perceived to be a valuable and essential part of the Robert Crown program. One of the major problems with the rink is storage space for kids in the hockey

program. There is an alcove adjacent to the studio rink entrance that could be easily enclosed for equipment storage. Bleachers are also an item that the staff felt was desirable. Currently there are a few benches for parents or observers to watch participants on the ice. Bleacher seating would be a desirable feature on the west side of the rink.

Main Rink

Of course the Main Rink is one of the major attractions of the entire facility. The Rink is in generally good condition, but requires renovation in a number of key areas. The grand stand seating has been repaired over the years due to cracking. The problem is pervasive and requires complete seating replacement. Along with that is the requirement for the provision of ADA accessible seating and a lift to accomplish that.

Structural bowing of the east wall and cracking of the wall at the grand stands requires immediate attention. The structural remedy strategy is outlined in detail in the Phase II Report. A replacement of the sound system and additional sound distribution at ground level is required to enhance the quality of practice and performance routines. Skate tile replacement and reflective ceiling replacement are required. For a description of detailed required work, see Phase II recommendations. The refrigeration system recommendations are also detailed in the Phase II Report.

Storage areas under the bleachers require cleaning and painting with fungicide to eliminate mold problems. Both exit doors at the north side of the rink also require architectural work to make them ADA accessible.

Storage

Adequate storage is a major problem at the Robert Crown Center. Additional storage is required for the following areas:

- Separate storage for ice show costumes currently in craft room.
- Additional and adequate storage for ice show props currently stored under bleachers in damp and inaccessible spaces.
- Additional storage for ice hockey program - currently stored under bleachers in moldy, damp and inaccessible spaces. Equipment has in the past been discarded because of mold growth. To avoid mold, equipment must be dry when placed in an enclosed storage space.
- Additional storage in studio rink for ice hockey equipment.
- Additional storage in gymnasium for day camp equipment
- Additional storage for day care program for large motor skill equipment. Also storage for cots would be required if a full-day program was implemented.
- Lockers for skating camp kids and equipment, also lockers for figure skating program kids (20) who attend programs before school, need to store their equipment during the day and come back after school for further instruction. Current lockers are only sized for street shoes – totally inadequate.

Office Space

The current office area is poorly organized, lacks windows (natural light), lacks adequate storage, security and adequate ventilation. Currently, the interior office space has no windows and "borrows" light from the main skylight over the lobby (skylight leaks). This does not provide adequate levels of natural light. The current office layout is open to the lobby through two large openings originally designed to accommodate skate rental. The staff was concerned about this set-up in terms of security. A fair amount of money is handled in this area, resulting in a potentially problematic situation. The staff felt that the office area should be secured from the main lobby area.

In addition to the spaces listed above, the coaches' area is currently located in the office

Photo A-13: Water Stained Ceiling Tiles at Office Area

area. A separate space is desired for the coaches' or "pro's" area. A separate staff bathroom is also desired. Remodeling the existing bathrooms for ADA compliance will result in the additional loss of office space.

Another major problem with the functional location of the offices is the inability to see or monitor the entry to the building from the office space. There is currently no visual control of the main entry to the building. At the present time, anyone entering the building can access the corridor to the day care rooms and gymnasium without being detected. This situation is one that calls for immediate attention.

Team Rooms/Locker Rooms

The men's and women's locker rooms located adjacent to the gymnasium are in poor shape physically and require selective renovation. This has been detailed in the "Interior Finishes" section of this report. As previously mentioned, separate bathrooms are required for the day care program, currently they share the existing locker room washrooms.

The existing men's and women's public restrooms are located on the north side of the concourse. Aside from their physical condition, the re-planning of these facilities is required. The main entry to the restrooms is directly in front of the main entrances to the ice rink. During ice shows, the circulation entrances are congested with lines for the bathrooms, and the public trying to enter and exit the main rink. Aside from being immodest (the restrooms have no doors) their location creates a major circulation problem.

Photo A-14: Ice Rink/Bleachers Showing Sound Booth

Concourse

The present concourse is a dark, poorly illuminated, under-utilized space. The lockers located within the concourse are insufficient in size; the seating areas are also inadequate. The current skating camps have 150 kids and there is virtually no place for them to eat lunch;

they end up sitting along the concourse walls and in the middle of circulation aisles.

Between the hours of 10 a.m. to 2 p.m. there are approximately a total of 400 children all vying for eating area, locker rooms and lockers. Clearly more rationally planned, expanded facilities are required.

The east end of the concourse is a poorly illuminated area. For approximately one hundred lineal feet, there are no rooms or activities located off the course to activate it and provide a supervised presence. The planning of the building has resulted in a dead, dormant area that is unable to be visually supervised by the office personnel. Planning solutions should be proposed to activate this area.

Photo A-15: Main Concourse

Main Entrance

The main entry to the Robert Crown Center is located under a 45 foot deep canopy which contains skylights and is supported by a structure of steel beams and concrete columns. In general, the condition of the entry area is dismal. The concrete slab at the main entry area and ramp area is cracked and requires repair. The concrete is also soiled by chewing gum stains. The skylights in the canopy leak and require replacement or repair as does the roof in this area.

Photo A-16: Main Entry

In addition, the entrance area is approximately two feet below grade which creates flooding problems inside the building during a hard rain. Handicap accessibility is an issue in that the two ramps down to the entry do not comply with the Illinois Accessibility Code.

As viewed from Main Street, the entrance is dark and foreboding, because it is recessed 45 feet and 2 feet below grade. Both of these conditions also cut down considerably on the amount of natural light entering the lobby. Due to the entry configuration, the Robert Crown Center does not portray an inviting, friendly image to the public.

Photo A-17: Main Canopy

As a solution to the issues stated above, and in this report, the notion of removing the canopy, filling in the existing exterior concrete entry area with an addition, and providing a new image for the Center, seems to be a viable option. This would certainly provide needed additional space, create a light-filled new lobby which would be supervisable and secure, and create a new inviting image for the Center. At the same time, the city would not be investing in renovating a portion of the building which in the future will again prove to be problematic and aesthetically unattractive. In addition, a new lobby at this location could serve as a circulation link to any possible future addition to the west. The space gained by filling in the southwest corner of the Crown Center building could provide the needed space for craft rooms, multipurpose rooms, offices and day care. Further study would be required to verify this, but in our opinion is worth pursuing.

Photo A-18: Main Entry Ramp

Photo A-19: Main Entry Atrium

Parking

Parking at the Center is inadequate on weekends, Wednesdays, and special events. There is at least one special event per month. During those times there are at least 25-30 cars parked in the grass at the west side of the building, and 20 cars parked illegally along Main Street. The skate park displaced a number of cars on the east side of the building. Along with the basketball area on the east, approximately 40 cars could be parked in a reclaimed lot. The bus drop-off area appears to be adequate in size. The staff suggested that a shaded canopy area be provided at the bus pick-up/drop-off for the 240 kids who gather every day. They tend to gather under the front canopy for shade, which is directly adjacent to the office area, creating an unacceptable noise level problem.

Photo A-20: North Side Parking

ADA Accessibility Survey

Overview

The intent of the Illinois Accessibility Code is "to ensure that the built environment, including all spaces and elements of all applicable buildings and facilities in the State of Illinois is so designed, constructed, and/or altered to assure the safety and welfare of all members of society and to be readily accessible to, and usable by, environmentally limited persons."

"This Code is also intended to resolve areas of difference between the federal accessibility standards, Americans with Disabilities Act Accessibility Guidelines (ADAAG), which are applicable to buildings and facilities covered by the Americans with Disabilities Act (ADA), and the Illinois Accessibility Code, IAC, which are applicable to buildings and facilities in the State of Illinois covered by the EBA." The EBA is the Environmental Barriers Act [410 ILCS 25].

Investigation Methods

The survey of the existing Robert Crown Center and Ice Rink Complex includes an assessment of the accessibility of the entire facility. The primary method used was on-site observation; on-site measuring to confirm existing dimensions for height, width, distance from walls, etc.; and comparing the existing conditions with the requirements listed in the Illinois Accessibility Code.

The second method for validating an existing physical space for Code compliance was to understand how the space, or a component of that space, was intended to be used and what motions/maneuvers are required to achieve that intended use.

Photo HC-1: Existing Handicap Ramp

Photo HC-2: Existing Concrete Slab Settlement at Main Entrance Doors

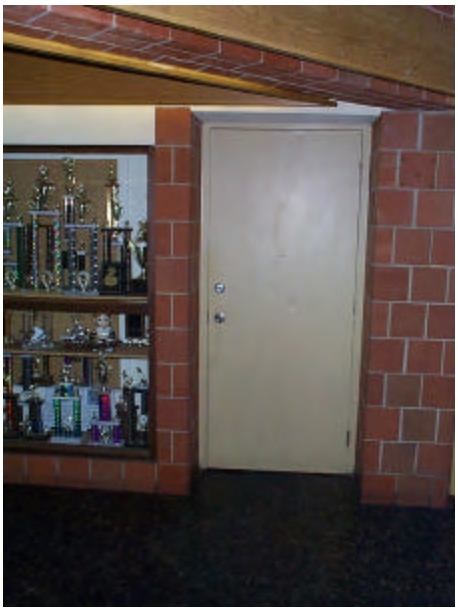


Photo HC-3: Non-compliant Door for Staff Office

Observations

The assessment of the Robert Crown Center, for compliance/noncompliance with the Accessibility Code, includes the accessibility requirements for site parking, signage and detectable warning systems, toilet/building accessibility, accessibility to the recreational areas, classrooms, and locker room facilities. Additional components include drinking fountains, counter heights, and locker accessibility.

Conclusions

Under the current requirements of the Illinois Accessibility Code, the Robert Crown Center complex is not compliant with the Code and is not "…readily accessible to, and usable by, environmentally limited persons". The following matrix lists the facility components that were investigated and records their compliance/non-compliance with the Code.

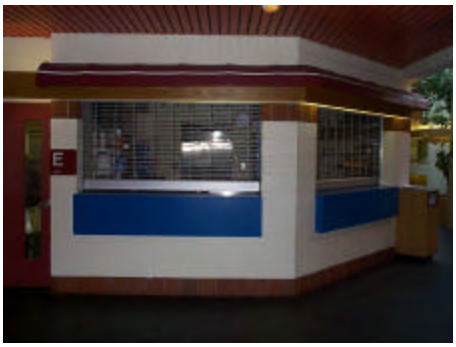


Photo HC-4: Non-compliant Food Service Counter

Photo HC-5: Non-compliant Door Into Team Room

Photo HC-6: Non-compliant Building Reception Counter

Component	Section Number 400.310 Illinois Accessibility Code	Complies / Does Not Comply	Remarks
Accessible On-site Parking			
Number of existing accessible parking spaces: 5	Subsection c) 1), page 33	Complies	93 Existing spaces = 4 required minimum number of accessible spaces
Signage: International symbol on pavement plus post-mounted signs	Subsection t) 1), page 35	Complies	Signage systems are provided for each space. Need van and loading zone signs.
Curb ramp: Adjacent to accessible spaces	Subsection d) 1), page 35	Complies	
Curb ramp: Slope / width / sides	Subsection d) 2) / 3) / 5), pages 35 & 36	Complies	
Curb ramp: Detectable warning	Subsection t) 1), page 36	**Does not comply**	**No detectable warning feature on curb ramp walking surface**
Accessible Ramp at Main Entrance			
Slope: Maximum = 1:12	Subsection e) 2), page 37	Complies	Existing slope at 1:13
Minimum width: Code = 36" between handrails	Subsection e) 3), page 37	Complies	Existing width at 48" between sidewalls
Handrails: Code = both sides of ramp, 34" to 38" above walking surface	Subsection e) 5E), page 38	**Does not comply**	**No handrails either side of ramp**
Intermediate landing: Code = 60" x 60"	Subsection e) 4), page 37	**Does not comply**	**Existing landing at 48" x 48"**
Exterior Doors: Main Entrance			
Door width	Subsection j) 4), page 47	Complies	
Door hardware	Subsection j) 8), page 48	Complies	
Doors in series	Subsection j) 6), page 48	Complies	
Door maneuvering clearance	Subsection j) 5), page 48; Fig. 25, p. 138	Complies	
Door threshold: Maxium height = 1/2"	Subsection j) 7), page 48	**Does not comply**	**Exceeds 1/2" due to settlement of the exterior concrete slab**
Interior Doors: Main Entrance			
Door width	Subsection j) 4), page 47	Complies	
Door hardware	Subsection j) 8), page 48	Complies	
Doors in series	Subsection j) 6), page 48	Complies	
Door maneuvering clearance	Subsection j) 5), page 48; Fig. 25, p. 138	Complies	
Door threshold: Maxium height = 1/2"	Subsection j) 7), page 48	Not applicable	
Interior Doors: Ice Rinks and Gymnasium			
Door width	Subsection j) 4), page 47	Complies	
Door hardware	Subsection j) 8), page 48	Complies	
Doors in series	Subsection j) 6), page 48	Not applicable	
Door maneuvering clearance	Subsection j) 5), page 48; Fig. 25, p. 138	Complies	
Door threshold: Maxium height = 1/2"	Subsection j) 7), page 48	Not applicable	
Interior Doors: Activity Rooms / Classrooms			
Door width	Subsection j) 4), page 47	Complies	
Door hardware	Subsection j) 8), page 48	Complies	
Door maneuvering clearance	Subsection j) 5), page 48; Fig. 25, p. 138	**Partial compliance**	**Multipurpose Room entry door does not comply**
Interior Doors: Administrative Area			
Door width	Subsection j) 4), page 47	Complies	
Door hardware	Subsection j) 8), page 48	**Does not comply**	**Combination of existing knob and lever handles: knob handles do not comply**
Door maneuvering clearance	Subsection j) 5), page 48; Fig. 25, p. 138	**Does not comply**	**Doors into area do not have 18" clearance on pull side of door**
Interior Doors: Team Rooms and Staff Offices			
Door width	Subsection j) 4), page 47	Complies	
Door hardware	Subsection j) 8), page 48	**Does not comply**	**Existing knob handles do not comply**
Door maneuvering clearance	Subsection j) 5), page 48; Fig. 25, p. 138	**Does not comply**	**Doors into team rooms and offices do not have 18" clearance on pull side of door**
Drinking Fountains			
Spout height: Maximum = 36"	Subsection l) 3A), page 51	Complies	
Spout location and controls	Subsection l) 3B) & 3C), page 51	**Does not comply**	**Flow of water is 5-1/2" from front edge (Code = 3") & control mounted on spout**
Fountain projection from the wall: Minimum = 17"	Subsection l) 3D), pages 51 & 52	**Does not comply**	**Existing projection from the wall = 13"**
Counters			
Administrative Area: Maximum height = 28" -- 34"	Subsection w) 4), page 72	**Does not comply**	**Existing height = 38"**
Concession: Maximum height = 28" -- 34"	Subsection w) 4), page 72	**Does not comply**	**Existing height = 46"**
Kitchen	Subsection w) 4), page 72	**Does not comply**	**Existing height = 36"**
Spectator Seating: Large Ice Rink			
1000 occupants: Code = 2% of total number	Section 400.320, subsection a) 1A), p. 73	**Does not comply**	**Existing seating area for wheelchair spectators = 0**

Component	Section Number 400.310 Illinois Accessibility Code	Complies / Does Not Comply	Remarks
Male Toilet / Locker Room			
Toilet Room wheelchair maneuvering clearances	Subsection n) 4), page 53	Complies	
Accessible stall	Subsection n) 5Aii), page 54; Fig. 30, p. 142	Complies	Alternative stall configuration with grab bars. Will not comply, if building is renovated
Accessible water closet height: Code = 17" -- 19"	Subsection n) 5Bii), page 55; Fig. 29, p. 141	**Does not Comply**	**Existing height at 20" above the floor**
Accessible urinal height: Code = 17" -- 19"	Subsection n) 6), page 56	**Does not Comply**	**Existing height at 20" above the floor**
Accessible lavatory height: Maximum = 34" w / water pipe protection	Subsection n) 7B) / 7D), pages 56 & 57	**Does not Comply**	**Existing lavatory height complies, no water pipe protection**
Accessible toilet accessories	Subsection n) 8), page 57	Complies	Soap dispensers & air hand dryers comply with side reach criteria. Mirrors/accessories do not comply.
Locker Room wheelchair maneuvering clearances	Section 400.220 a)-e), page 24	**Does not comply**	**Distance between lockers & bench = 30", no space available for maneuvering**
Accessible shower controls and bench	Subsection r) 3), page 64	**Does not Comply**	**Controls for side approach within the maximum 54" height, no bench**
Female Toilet / Locker Room			
Toilet Room wheelchair maneuvering clearances	Subsection n) 4), page 53	Complies	
Accessible stall	Subsection n) 5Aii), page 54; Fig. 30, p. 142	Complies	Alternative stall configuration with grab bars. Will not comply if building is renovated.
Accessible water closet height: Code = 17" -- 19"	Subsection n) 5Bii), page 55; Fig. 29, p. 141	**Does not comply**	**Existing height at 20" above the floor**
Accessible lavatory height: Maximum = 34" w / water pipe protection	Subsection n) 7B) / 7D), pages 56 & 57	**Does not comply**	**Existing lavatory height complies, no pipe protection**
Accessible toilet accessories	Subsection n) 8), page 57	Complies	Soap dispensers & air hand dryers comply with side reach criteria. Mirrors/accessories do not comply.
	Section 400.220 a)-e), page 24	**Does not comply**	**Distance between lockers & bench = 30", no space available for maneuvering**
Employee Toilet Rooms			
Door width	Subsection j) 4), page 47	**Does not comply**	
Door hardware	Subsection j) 8), page 48	**Does not comply**	**General note: The employee toilet rooms do not appear to have been initially**
Door maneuvering clearances	Subsection j) 5), page 48; Fig. 25, P. 138	**Does not comply**	**designed for handicap persons & at their present size, cannot be renovated to**
Accessible fixtures	Subsection n) 10), page 57 & n) 3)-8), p. 57	**Does not comply**	**meet current Accessibility Code requirements**
Accessible accessories	Subsection n) 10), page 57 & n) 3)-8), p. 57	**Does not comply**	
Team Room Toilets / Showers			
Accessible water closet height: Code = 17" -- 19"	Subsection n) 5Bii), page 55; Fig. 29, p. 141	Complies	
Accessible urinal height: Code = 17" -- 19"	Subsection n) 6), page 56	**Does not comply**	**Existing height at 21" above the floor**
Accessible lavatory height: Maximum = 34" w / water pipe protection	Subsection n) 7B) / 7D), pages 56 & 57	**Does not comply**	**Existing lavatory complies, no water pipe protection**
Accessible toilet accessories	Subsection n) 10), page 57 & n) 3)-8), p. 57	Complies	
Accessible accessibility to showers	Subsection o) Bvi), page 61	**Does not comply**	**Existing shower curb height = 3"**
Accessible shower controls and bench	Subsection r) 3), page 64	**Does not comply**	**Controls for side approach within the maximum 54" height, no bench**
Note: Accessible lockers, pay phones, facility general signage and concession seating does not exist in the Facility.			

Section 3
Civil

CIVIL

Overview

The Robert Crown Center is located on the north side of Main Street, west of Dodge Avenue. Parking areas are located to the immediate south and west of the building. An additional pavement area, which is recreational in nature, is located immediately to the east of the building. The facility is located within the boundaries of a larger park. The park bounds the facility on the north, east and west sides.

Photo C-1: Parking lot flooding looking Southwest.

Investigation Methods

The method used for this investigation was visual observation as well as review of the drawings provided by the City staff and photographs C-1 and C-2 illustrating the parking lot flooding that occur after a torrential rainfall.

Observations

The building and adjacent parking and pavement areas are situated below the elevation of Main Street and below the elevation of the majority of the surrounding park. An underground drainage system has been provided for the pavement areas surrounding the building. This system consists of catch basins and sewers connecting to the existing sewer system in Main Street. Only one catch basin was observed in the park. That catch basin is located north of the northeast corner of the building. The routing of the sewer associated with this catch basin is not visually apparent.

Photo C-2: Parking lot flooding looking West.

The parking and pavement areas are situated at a lower elevation than the building entry area. These areas are also lower than the surrounding park, and therefore capture runoff from the entire park, particularly in larger, more intense rainfall events. However, the entire first floor of the building is at the lowest elevation. Whenever the detention capacity of the existing

parking lot is exceeded, the water overflows the curb line and floods the Community Center Building. In addition, moss was observed to be growing on the north side of the building. This growth would seem to indicate that a proper drainage slope away from the building does not exist as the area is holding moisture. The catch basins in the parking and pavement areas appeared to be in good condition. The sumps of the catch basins were full of water and other debris. The condition of the sewers could not be visually observed but there did not appear to be any obstructions at the catch basins.

Record drawings of the facility indicate the drainage system. The pipe sizes utilized are small, 6", 8" and 12" diameters. A common practice in the design of storm sewer for parking areas is not to use pipe sizes less than 12" in diameter. This practice would have been common at the time the facility was designed. The purpose of this practice is to provide for easier maintenance of the sewers and to provide less potential for obstructions to occur in the sewers. That smaller pipe sizes were used seems to indicate that the sewer system was not designed by a civil engineer.

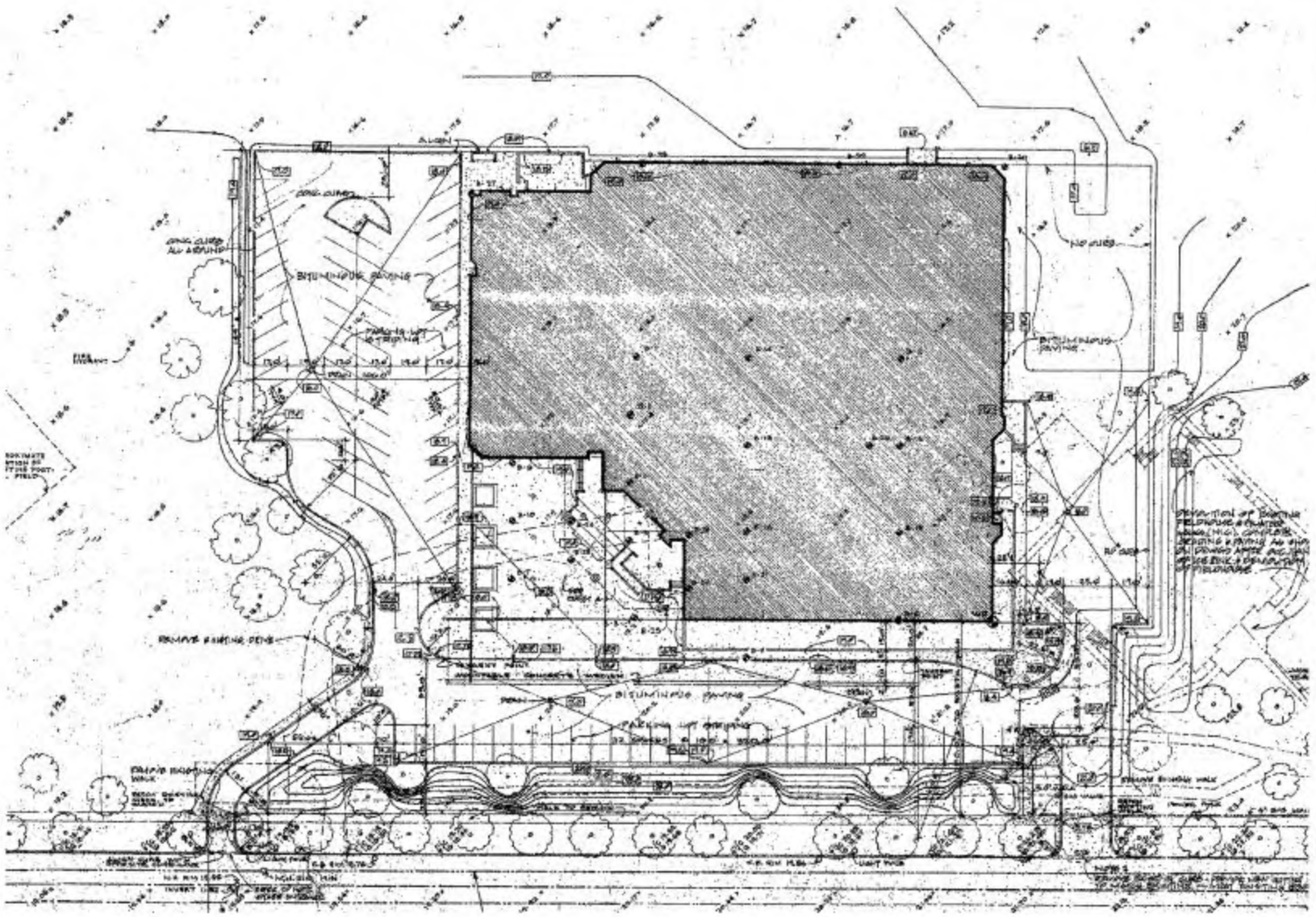
No information has been provided as to what rainfall design criteria was used to size the sewers. At the time of the design of facility, rainfall intensities may have been taken from TP-25, TR-40, values provided by the then MSD, now MWRD, or the City of Evanston. In any case, the sewer design is inadequate per current design standards. The record drawings do not clearly indicate that the parking areas were designed to provide stormwater detention.

Conclusions

The design of the existing drainage system, intentionally or not, causes detention to occur in the parking areas. Because the main floor of the building and adjacent parking areas are lower than the surrounding park and streets, when the storm water storage capacity of the

parking areas is exceeded, as we have been advised has occurred on numerous occasions, the building floods. This situation is an inevitable consequence of the site design of the facility.

No emergency overflow routes were provided, nor could be provided given the building was situated lower than the surrounding streets and park.



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ROBERT CROWN CENTER
EVANSTON, IL

SITE PLAN

PROJECT NUMBER	DATE
22288.01	01.01.03
SKETCH NUMBER: CSK-0	DRAWN BY: JGB

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Section 4
Structural

Structural Overview

The existing building structure and structural drawings were reviewed with respect to current conditions, current code requirements, and specific client concerns. Observations of the current conditions are listed below within the Observations sub-section.

The structure was originally designed to conform to code requirements of mid-1970's. The current code (BOCA 1996) requirements for wind loading, and snow drifting criteria exceed the values used within the original design. Specific findings are listed below within the Observations sub-section.

Various existing conditions were of specific concern including the eastern wall of the main ice rink, the connection of roof joists above the main ice rink, and the eastern end of the concrete grandstands within the main ice rink.

Photo S-1: Main Ice Rink – Joist Bearing – Southern Wall - Roof joist bottom chord connection to masonry wall.

Photo S-2: Main Ice Rink – Joist Bearing - Southern Wall – Roof joist bottom chord connection to masonry wall.

Photo S3: Main Ice Rink – Eastern Wall – Crack in masonry wall.

Observations

Structural Systems

- Typically the roof framing system consists of 1-1/2" deep painted metal deck bearing on open web steel joists supported by bearing masonry walls. At the entry area, the metal deck bears on steel beams supported by circular concrete columns.
- The wall system consists of load bearing masonry with reinforced piers resisting the lateral loads.
- The foundation system consists of continuous spread footing beneath masonry walls, and isolated footings at columns.

Main Ice Rink – Joist Bearing

The roof joists within the main ice rink span approximately 121 feet. The bottom chord member of the joists is welded to an angle that is anchored to the masonry wall. This type of connection was common in the 70's and 80's, but experience has proven that it is ineffective.

The wall and bottom chord push/pull against each other because of the imposed wind loads and snow loads. The length of the roof joist and the height of the masonry wall compound this condition. Eventually the connection fails in some manner as exhibited by Photo S-1.

Main Ice Rink – Eastern Wall

The roof joist bridging within the main ice rink attaches the masonry wall to the roof diaphragm (metal roof deck). This type of connection was common in the 70's and 80's, but experience has proven that it is ineffective. The wall and joist bridging push/pull against each other because of the imposed wind loads and snow loads. The length of the roof joist and the height of the masonry wall compound this condition. While these connections have not failed, the wall has bowed outward slightly in response to these forces. The wall exhibits a continuous horizontal crack on the interior face approximately two or three courses above grade. (Photos S-4 and S-5). This condition has also resulted in cracking of the south wall at the westernmost joist.

Main Ice Rink – Concrete Grandstand

The eastern end of the existing concrete grandstand has settled more than the adjacent exterior wall. The differential movement has resulted in a warped doorframe. The door within the framing is pinched between the finish floor and the frame, so that it does not work properly. A temporary shoring post was installed adjacent to the door opening. (Photos S-6 and S-7)

Studio Ice Rink – Masonry Walls

The masonry walls exhibit vertical cracks predominately on the southern wall.

Photo S-4: Main Ice Rink – Eastern Wall – Bowed masonry wall.

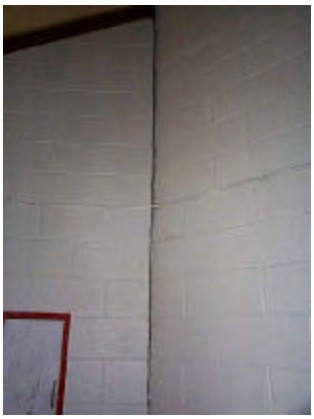


Photo S5: Main Ice Rink – Eastern Wall – Bowed masonry wall.

Photo S6: Main Ice Rink – Eastern End of Concrete Grandstand – Pinched doorframe.

Warming Room (B-101) – Masonry Wall

Two perpendicular walls near the old women's bathroom, at the northwestern corner of Room B-101, have pulled apart.

Drifting Snow Loads

Various roof joists were reviewed with respect to the current snow drifting load requirements (BOCA 1996). Many of the joists adjacent to the gymnasium and the main ice rink were deficient with regard to shear capacity. The joists were up to 20% over-stressed when comparing the current snow drifting criteria to the capacity of the joist established by the Steel Joist Institute.

Wall Wind Loads

The existing walls were reviewed with respect to the current wind loading requirements (BOCA 1996). The taller walls associated with the Main Ice Rink and the Gymnasium were deficient with regard to bending capacity. The walls were up to 100% over-stressed when comparing the current wind load criteria to the capacity of the wall reinforcement indicated on the existing drawings.

Conclusions

A number of existing structural conditions do not meet the current building code standards. At this time, there is no requirement by the City of Evanston to revise these elements, but it is our recommendation that remedial action be taken. In the recommendations portion of the report, structural details and costs are included to verify these various structural deficiencies.

Photo S7: Main Ice Rink – Eastern End of Concrete Grandstand – Shoring adjacent to pinched doorframe.

Section 5
Mechanical

MECHANICAL

Overview

The Robert Crown Center is a single story building with a mechanical penthouse on the roof. The penthouse houses air-handling units serving the building. The Mechanical systems serving the building are the original systems. Modifications and repairs have been made in an attempt to improve the equipment performance. The building is served by five air handling units. Two units serve the Skating Rink, one unit serves the Studio Rink, one unit serves the Offices and Public spaces and another unit serves the Gym.

Photo M-1: Air handling unit in Skating Rink

Investigation Methods

The survey of the existing Robert Crown Center and Ice Rink Complex includes a description of the Mechanical systems serving the facility. Existing conditions were reviewed in the field and the design documents were reviewed and used as the basis of our evaluation of our survey.

Photo M-2: Cabinet heater in vestibule

Observations

The heating for the building is provided by a combination of hot water gas and electrical resistance heating elements. The Skating Rinks and Office units utilize hot water coils and the Gym unit incorporates a gas fired duct furnace. lectrical baseboard radiation is located in the lobby, below the skylight, below the perimeter glass, and in the Gym at the roof deck.

A single boiler provides hot water for the heating and reheat zone coils. The original design of the systems was intended to use hot water generated by the chillers for the coils (a heat recovery system).

The cooling for the building is provided by a combination of chilled water and direct expansion. The ice rinks use chilled water

Photo M-3: Roof mounted condensing unit

produced by the ice rink refrigeration chillers.

The office and gym units are served by roof mounted condensing units. These units are located on the opposite sides of the penthouse.

The chilled water system has a cooling tower located on the north side of the building at the grade level. The tower has been replaced within the last couple of years.

The air is distributed through sheet metal ductwork to the various areas of the building. The system serving the office and public areas was designed as a multi-zone system with hot water reheat coils, each with a separate thermostat. The office unit has been retrofitted with VAV boxes to modulate the air volume in an effort to reduce energy consumption. The VAV zones have hot water reheat coils installed both upstream and downstream of the boxes. The coils were active during the onsite observations. The VAV boxes serve both interior and perimeter zones from the same boxes. Both the Gym unit and the Office unit have variable frequency drives to allow reduction in the system air volume.

The building has a number of exhaust fans, which exhaust general areas, toilet rooms, locker rooms and meeting rooms. A total of fourteen units were noted on the building documents.

Conclusions

The general condition of the equipment is fair. Most of the equipment appears to require maintenance and repair. Most of the equipment has met or exceeds its normal operational life. See attached chart for detailed assessment survey. The Phase II Report itemizes replacement costs.

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
MECHANICAL									
Supply Fan SF-1	Unsatisfactory	1	26	25	1		B-124	--	7,420 cfm (2)
Supply Fan SF-2	Unsatisfactory	1	26	25	1		B-106	--	18,000cfm (2)
Supply Fan SF-3	Unsatisfactory	1	26	25	1		B-106	--	18,000 cfm (2)
Supply Fan SF-4	Unsatisfactory	1	26	25	1		B-125	--	25,670 cfm (2)
Supply Fan SF-5	Unsatisfactory	1	26	25	1		B-125	--	9,000 cfm (2)
Exh. Fan EF-1	Satisfactory	1	26	20	2		B-102	--	240 cfm Domex (2) (3)
Exh. Fan EF-2	Satisfactory	1	26	15	1		B-123	--	120 cfm Broan (2) (3)
Exh. Fan EF-3	Satisfactory	1	26	15	1		B-107	--	120 cfm Broan (2) (3)
Exh. Fan EF-4	Satisfactory	1	26	25	5		B-125	--	8,100 cfm In-Line (2) (3)
Exh. Fan EF-5	Satisfactory	1	26	25	5		B-125	--	20,000 cfm In-Line (2 (3)
Exh. Fan EF-6	Satisfactory	1	26	20	2		B-120	--	860 cfm Domex (2) (3)
Exh. Fan EF-7	Satisfactory	1	26	20	2		A-134	--	2,120 Domex (2) (3)
Exh. Fan EF-8	Satisfactory	1	26	20	2		B-130	--	120 cfm Domex (2) (3)
Exh. Fan EF-9	Satisfactory	1	26	20	2		A-114	--	1,900 cfm Domex (2) (3)
Exh. Fan EF-10	Satisfactory	1	26	15	1		A-121	--	60 cfm Broan (2) (3)
Exh. Fan EF-11	Satisfactory	1	26	20	2		A-105	--	400 cfm Domex (2) (3)
Exh. Fan EF-12	Satisfactory	1	26	20	2		B-105	--	1,450 cfm Domex (2) (3)
Exh. Fan EF-13	Satisfactory	1	26	20	2		A-120	--	295 cfm Domex (2) (3)
Exh. Fan EF-14	Satisfactory	1	26	15	5		A-107	--	120 cfm Broan (2) (3)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Room# / Location	Estimate of (1) Replacement / Cost 10 Yr. Needs	Comments
MECHANICAL									
Pump P-1	Satisfactory	1	26	20	2			--	Condenser pump 142 gpm (2)
Pump P-2	Satisfactory	1	26	20	2			--	Condenser pump 160 gpm (2)
Pump P-3	Satisfactory	1	26	20	2		B-104	--	Brine pump 605 gpm (2)
Htg Coil HC-1	Unsatisfactory	1	26	20	2		A-134	--	3 sq. ft. (3)
Htg Coil HC-2	Unsatisfactory	1	26	20	2		A-134	--	6 sq. ft. (3)
Htg Coil HC-3	Unsatisfactory	1	26	20	2		A-125	--	3.75 sq. ft. (3)
Htg Coil HC-4	Unsatisfactory	1	26	20	2		A-134	--	7.5 sq. ft. (3)
Htg Coil HC-5	Unsatisfactory	1	26	20	2		A-116	--	3.0 sq. ft. (3)
Htg Coil HC-6	Unsatisfactory	1	26	20	2		A-102	--	7.5 sq. ft. (3)
Htg Coil HC-7	Unsatisfactory	1	26	20	2		A-105	--	1.5 sq. ft. (3)
Htg Coil HC-8	Unsatisfactory	1	26	20	2		A-105	--	3.75 sq. ft. (3)
Htg Coil HC-9	Unsatisfactory	1	26	20	2		A-120	--	1.0 sq. ft. (3)
Htg Coil HC-10	Unsatisfactory	1	26	5	2		A-134	--	1.5 sq. ft. (3)
Htg Coil HC-11	Unsatisfactory	1	26	20	2		A-134	--	1.0 sq. ft. (3)
Htg Coil HC-12	Unsatisfactory	1	26	20	2		A-134	--	7.5 sq. ft. (3)
Htg Coil HC-13	Unsatisfactory	1	26	20	2		A-134	--	1.0 sq. ft. (3)
Htg Coil HC-14	Unsatisfactory	1	26	20	2		B-124	--	3.75 sq. ft. (3)
Htg Coil HC-15	Unsatisfactory	1	26	20	2		B-124	--	13.8 sq. ft. (4)
Htg Coil HC-16	Unsatisfactory	1	26	20	2		B-106	--	40.5 sq. ft. (4)
Htg Coil HC-17	Unsatisfactory	1	26	10	2		B-106	--	40.5 sq. ft. (4)

(1) Based on Current Costs (2) Included Electrical Hook-Up 3) See Recommendations (4) Included on Supply Fan
Categories – Satisfactory Unsatisfactory

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
MECHANICAL									
Unit Htrs UH-1	Satisfactory	1	26	13	1		B-105	--	Gas 12.5 MBH Input (2)
Unit Htrs UH-2	Satisfactory	1	26	13	1		B-104	--	Gas 20.0 MBH Input (2)
Unit Htrs UH-3	Satisfactory	1	26	13	1		B-101	--	Gas 31.0 MBH Input (2)
Air Cooled Condenser ACC-1	Satisfactory	1	3	20	17		Exterior B-125	--	Trane RA-750
Air Cooled Condenser ACC-2	Unsatisfactory	1	26	20	1		Exterior B-125	--	Trane RA-250 294,000 BTU (2)
Duct Furnace	Unsatisfactory	1	16	13	1			--	
Boiler	Satisfactory	1	24	15	1			--	
Boiler – HW	Satisfactory	1	3 Mo.	30	29	-			Weil McClain Gas-Fired Steam With Tanks (2)
Elect. Rad. Htrs.	Unsatisfactory	10	26	15	1			--	Delete due to ComEd rates

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
MECHANICAL								
Cooling Tower	Satisfactory	1	3	20	17		--	10 year Maintenance
Ductwork	Satisfactory	--	26	30	4			Lump Sum (3)
Piping	Satisfactory	--	26	30	4			Lump Sum HVAC Systems Only (3)
Temperature Controls	Satisfactory	--	26	16	1		--	(3)
VAV Boxes	Unsatisfactory	16	16	20	1		--	(3)
Relief Vents	Satisfactory	4	26	30	4		--	

MECHANICAL SUBTOTAL -
(immediate needs)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 6
Electrical

ELECTRICAL

Overview

The Robert Crown Center is a single story multi-use sports facility with a small mechanical penthouse. The occupancy is defined as an "Area of Assembly" for purposes of determining Electrical requirements.

Investigation Methods

The electrical system was reviewed visually and by means of observing the manufacturers' nameplates on the various components of the electrical system.

Observations

The electrical service is a 1600 Amp 480 Volt switchboard located in a Ground Floor Mechanical Room. This switchboard appears to have suffered no significant deleterious effects from sharing a room with the refrigeration equipment for the complex. The emergency electrical system is tapped from the incoming service cables in a fashion that is no longer recognized by the Code as meeting the requirements for a back-up electrical service for emergency power, but the Code requirements do acknowledge the suitability of individual battery packs for this occupancy; such battery packs are presently installed.

Distribution panels are situated in various locations around the facility, within the loci of the major loads such as air handing units, cooling units, etc. The vast majority of this equipment remains in serviceable condition.

The blade tension of many of the wiring devices has degraded over time and many of the wet locations do not have GFI receptacles, which is a fairly recent addition to the Code. There is also a noticeable lack of service receptacles adjacent to major pieces of rooftop and outside mechanical equipment.

Photo E-1: Distribution Panel in Rooftop Mechanical Room

Photo E-2: Variable Frequency Drives in Rooftop Mechanical Room

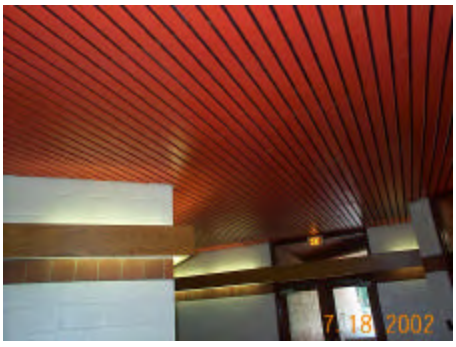


Photo E-3: Typical Corridor Lighting Treatment

As fluorescent lamps age, their efficacy decreases, causing the light output to degrade significantly. Many of the light fixtures installed at the facility presently have notably reduced light outputs, leaving the light levels in the majority of the areas to be wholly inadequate. The following is a list of various areas of the facility and their existing lighting levels that are less than the recommended levels for those areas.

Conclusions

With notable exceptions, such as some of the lighting fixtures and some wiring devices, the electrical equipment remains serviceable.

Robert Crown Existing Illumination Levels

Area	**Existing (fc)**
South Main Corridor *	
Under fixture	7.5
Center of corridor	0.8
Typical point	2.9
North Main Corridor *	
Under fixture	6.9
Typical point	2.3
East Corridor	
Center of corridor	3 - 4.5
Gymnasium	30 - 50
Studio Rink *	
Center of rink	12.1
South end	12.5
North end	14.3
Under fixture	55.3
Main Rink	
Center of rink	12.1
South end	12.5
North end	14.3
Under fixture	55.3
Ice re-surfacer garage	27
North Locker Room	5.4 - 7.7
Boys Main Toilet Room	
Stall	6 - 8
General	25
At Lavatories	19

Locker Room	25
Girls Toilet Room	
Stall	13
General	30
Skate Storage Room	18.5
Kitchen	42
Main Office	17 - 49
Small Office	46

Room C – Arts & Crafts	54-64
Multi-purpose Room	28-30
Game Room	10-17

Parking Lot - See Phase II Report for Parking Lot Lighting recommendations.

Note * - Although lighting levels are important, of comparable importance is the uniformity of the lighting levels over the entire area. This should not vary by more than 1.5:1 to 2:1 for visual comfort.

See the attached chart for detailed electrical devices Assessment Survey in Phase II Report itemizes replacement costs.

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of [(1)] Replacement Cost Immediate Needs	Room #/ Location	Estimate of [(1)] Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL									
Electrical Main Switchboard	Satisfactory	1	26	50	24	--	B-104	--	
Double-Sided Distribution Panel	Satisfactory	1	26	50	24	--	B-104	--	
Distribution Panel 1	Satisfactory	1	26	50	24	--	B-104	--	
Power Panel 1	Satisfactory	1	26	50	24	--	B-104	--	
Power Panel 2	Satisfactory	1	26	40	24	--	B-125	--	
Emergency Panel	Satisfactory	1	26	40	14	--	B-104	--	
Lighting Panel A	Satisfactory	1	26	40	14	--	B-115	--	
Lighting Panel B	Satisfactory	1	26	40	14	--	B-127	--	
Lighting Panel C	Satisfactory	1	26	40	14	--	B-104	--	
Lighting Panel 1	Satisfactory	1	26	40	14	--	B-115	--	
Lighting Panel 2	Satisfactory	1	26	40	14	--	B-115	--	

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL									
Lighting Panel 3	Satisfactory	1	26	40	14	--	A-118	--	
Lighting Panel 4	Satisfactory	1	26	40	14	--	A-121	--	
Lighting Panel 5	Satisfactory	1	26	40	14	--	B-104	--	
Lighting Panel 6	Satisfactory	1	26	40	14	--	A-106	--	
Lighting Panel 7	Satisfactory	1	26	40	14	--	B-127	--	
Canopy Lighting Panel	Satisfactory	1	26	40	14	--		--	
Transformer T-1	Satisfactory	1	26	40	34	--		--	

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of [1] Replacement Cost Immediate Needs	Estimate of [1] Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL								
2x4 Fixture	Unsatisfactory	78	26	20	0		--	(3)
1x4 Fixture	Unsatisfactory	55	26	20	0		--	(3)
4x4 Fixture	Unsatisfactory	2	26	20	0		--	(3)
8 Strip Fixture	Unsatisfactory	107	26	20	0		--	(3)
Porc.Socket	Unsatisfactory	12	26	20	0		--	(3)
Downlight	Unsatisfactory	76	26	20	0		--	(3)
Shower Light	Unsatisfactory	71	26	20	0		--	(3)
4" Strip Fixture	Unsatisfactory	20	26	20	0		--	(3)
Metal Halide	Satisfactory	70	15	30	15			
2x2 Fixture	Unsatisfactory	1	26	20	0		--	
Exit Signs	Satisfactory	21	15	20	5		--	
Park. Lot	Unsatisfactory	4	26	20	0		--	30" Pole (3)
Park. Lot	Unsatisfactory	10	26	20	0		--	15' Pole (3)
2' Strip Fixture	Unsatisfactory	60	26	20	0		--	(3)
Pendant Fixture	Satisfactory	28	26	20	1		--	
Elec. Heater	Satisfactory	19	26	20	1		--	
Battery Units	Satisfactory	4	26	20	1		--	
Outlets	Satisfactory	Lot	26	20-30	1		--	
Switches	Satisfactory	Lot	26	20-30	1		--	
Ext. Light	Satisfactory	7	26	20	1		--	
Wiring	Satisfactory	Lot	26	40-50	14		--	
Plant. Outlets	Unsatisfactory	4	26	15	0		--	

() Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL								
Sound System								
Ice Rinks	Satisfactory	Lot	15	25	10	--		
Interior	Unsatisfactory	Lot	26	25	--		--	
Security	--	--	--	--	--	--	--	
Tele/Data	Satisfactory	Lot	--	--	--	--		
Pneumatic Switch	Unsatisfactory	1	26	20	0		--	

ELECTRIC SUBTOTAL -
(immediate needs)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 7
Plumbing

PLUMBING

Overview

The building is a single-story, multi-use building with a mechanical penthouse on the roof. The overall building area is approximately 61,000 square feet.

Photo P-1: Incoming water service.

Investigation Methods

The survey of the existing Robert Crown Center and ice rink includes an assessment of the existing plumbing systems. In addition, the requirements of the local building codes and amendments were reviewed relative to the installed plumbing system. The following narrative provides an overview of our observations.

Observations

The domestic water system is a one-zone system fed directly from the city water main without a booster pump. Incoming water service pipe is 4" with two (2) 3" water meters. The main water valve shows signs of deterioration.

Photo P-2: Water meters.

The main water heater system is located in the penthouse. The system is comprised of two (2) recently replaced 240,000 BTU gas-fired heaters, each with a 100-gallon storage tank. The original water heater system was one (1) 540,000 BTU gas-fired heater with one 250 gallon storage tank.

Plumbing fixtures are original and for the most part show little signs of wear. Faucets in toilet rooms do not meet present ADA requirements. Handicapped water closet enclosures do not accommodate wheelchairs. Water and waste piping below lavatories are not protected by an insulated covering as required by ADA.

Photo P-3: Plumbing Fixtures.

The galvanized water piping within the building is original and therefore could potentially contain mineral build-up which would restrict and decrease flow. However, faucets and flush valves were activated to visually confirm

adequate water pressure to the fixture. The water flow and pressure appeared to be adequate.

The existing drinking fountains do not meet present ADA requirements.

Gang shower fittings in locker rooms show signs of wear, with some control valve plates missing. Hot water supply temperature does not meet present code requirements. Hot water supplied to daycare child fixtures directly from central hot water heater does not meet present code safety requirements.

Women's Toilet Room B102 fixtures have been removed and a heating boiler has been installed in this room. Warming Room B101 is used as a general storage area.

The building has two (2) duplex submersible sump pump systems which handle the underground drain tile system. The pump system, located in the Surfacer room, was replaced within the past two years. The pump system, located in the storage room, is original and appears to be in good working condition.

Roof drain inlets viewed appear to be in good condition. All storm piping at the ceiling below is insulated and also appears in good condition.

The cold water supply line connected to the hot water system, which supplies water to the ice-melting pit located in the Surfacer room, does not have any backflow prevention device as required by code.

Conclusions

Although the overall plumbing systems are currently functional, there are a number of the components that do not comply with the current Illinois Plumbing Code or the Illinois Accessibility Code. See attached chart for a detailed assessment of each plumbing device. See Phase II recommendations report for itemized replacement costs.

Photo P-4: Drinking fountain.

Photo P-5: Gang showers.

Photo P-6: Roof drain.

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
PLUMBING								
Sanitary	Satisfactory	System	26	In excess of 50	24			Repairs
Sub-Soil	Unsatisfactory	System	26	In excess of 50	24			Possible blockage in S.E. corner of gym
Storm	Satisfactory	System	26	In excess of 50	24			Repairs
Rodout Basin	Satisfactory	7	26	In excess of 50	24			Repairs
Catch Basin	Satisfactory	1	5	In excess of 50	45			
Domestic C.W.	Satisfactory	System	26	In excess of 50	24			Repairs
Domestic H.W.	Satisfactory	System	26	25-30	4			Repairs
Sump Pumps	Satisfactory	4	10	20	10			
Water Closet	Satisfactory	48	26	In excess of 50	24			Flushing Devise (3) 25 Years
Urinal	Satisfactory	11	26	In excess of 50	24			Flushing Devise (3) 25 Years
Lavatory	Satisfactory	37	26	In excess of 50	24			Faucet 25 Years (3)
Drink. Fountain	Satisfactory	5	26	In excess of 50	24			Faucet 25 Years (3)

() Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
PLUMBING (cont'd)								
Dishwasher	Unsatisfactory	1	26	10	0			
Plaster Trap	Satisfactory	1	26	25	1			
Mop Basin	Satisfactory	3	5	In excess of 50	45			Faucet
Double Sink	Satisfactory	2	26	In excess of 50	24			Faucet
Sink	Satisfactory	1	26	In excess of 50	24			Faucet
Shower	Satisfactory	18	26	In excess of 50	24			(3)
Water Heater	Satisfactory	2	6 Mo.	10	9			
Recirc Pump	Satisfactory	1	20	10	1			
Floor Drain	Satisfactory	20	26	In excess of 50	24			
Roof Drain	Satisfactory	6	26	In excess of 50	24			
Hose Bibb	Satisfactory	4	26	50	24			

PLUMBING SUBTOTAL -
(immediate needs)

1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations (4) Included on Supply Fan

Section 8
Fire Protection

Fire Protection

Overview

The building is a single story (with mechanical penthouse) multi-use building of non-protected construction. The building is a non-separated mixed use group occupancy consisting of Assembly Occupancy and Educational Use Group Occupancy. The overall building area is approximately 61,000 square feet. Non-separated mixed-use group occupancies must apply the most stringent requirements of any of the contained occupancies over the area of the entire building. Therefore, the current adopted building code (BOCA 1996) would require a sprinkler system throughout the entire facility. The building is partially sprinklered.

Investigation Methods

The survey of the existing Robert Crown Center and Ice Rink Complex includes an assessment of the existing fire protection sprinkler systems. In addition, the requirements of the local building code and amendments were reviewed relative to the installed sprinkler system. The following narrative provides an overview of our observations.

Observations

Sprinkler protection is provided in the following areas:

a. Nursery-Childcare Room (A124 and Room 119)
b. Craft Room (A106, including costume area, storage area A108 and kiln closet A107).
c. Multi-purpose room (A103).
d. Kitchen (A105)
e. Men's and Women's locker rooms located off of the gymnasium. (A116, A117, A112-A115)
f. Ground floor mechanical rooms.
g. Surfacer room. (B105)

h. Storage Room/Old Warming Room (B101) (except under mezzanine).
i. Concession Stand (A120).
j. Corridor A102 between Childcare and Craft rooms (leading to Gymnasium).
k. Incoming water service/storage room A104.
l. Offices and rental stand A127, A128 & A132.
m. Mechanical room B104.

Sprinkler protection is not provided in the following areas:

a. Gymnasium A109.
b. Main skating rink B106.
c. Studio rink B124.
d. Mechanical Penthouse.
e. Bathrooms, locker rooms and storage rooms at ice skating rink, B109-B121.
f. Main entry vestibule A101 and Lobby A133.
g. Main concourse A134 outside of ice skating rink.
h. Boiler room B102 (converted bathroom off of storage room).
i. Sump pump room B115.
j. Bathroom B103.
k. Referee room B107.
l. First aid room B123.

A standpipe system is not provided. A standpipe system is required in buildings where the floor level of the highest story is located more than 30 feet above the lowest level of fire department vehicle access or in buildings where any portion of the building floor area is more than 400 feet of travel from the nearest point of fire department vehicle access (unless the building is equipped throughout with an automatic sprinkler system). Neither of these apply to this building, therefore a standpipe system is not required.

The building is supplied with a 4" incoming fire protection service that is separate from the incoming water service.

Photo FP-1: Single check backflow preventer on fire protection service.

The fire protection water supply is provided with a single 4" check valve (model – "Star", UL listed and FM approved), with a 4" gate valve

(model – "Traverse City") on either side of the check valve. These valves appear to have been installed with the original 1974 construction.

A 4" by 2-1/2" by 2-1/2" fire department siamese connection is provided for auxiliary fire department use on the south face of the building facing Main Street.

The pressure gauge at the incoming fire protection service indicates a static water pressure of approximately 65 psi. The existing sprinkler system is supplied off of city pressure only (no existing booster fire pump). There is no hydraulic placard at the incoming service which indicates that the sprinkler system is likely designed as a pipe schedule system.

Water flow information received on July 11, 2002 from the City of Evanston water department indicates the following available water supply:

- 46 psi static
- dropping to between 24 psi and 18 psi residual when flowing between 712 gpm and 750 gpm.

According to the water department, the city water mains in the vicinity of the Robert Crown Center are all older 6" mains.

(Note: the 65 psi on the gauge in the building is likely due to trapped pressure on the system as the check valve will hold the pressure at the highest the system ever sees as the water supply fluctuates up and down.

The City of Evanston requires a 10 psi safety factor below the seasonal low water test supply in the design of sprinkler systems per the current code amendments.

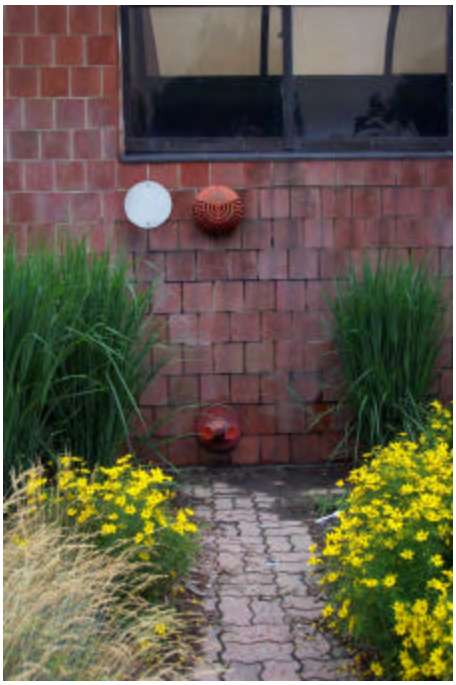


Photo FP-2: Fire department siamese connection and outside electric alarm bell.

Photo FP-3: Chained and locked valves on fire protection service.

Based on the above water flow data, the city water supply alone is not sufficient to supply the sprinkler system. See calculation below:

- Approximately 40 psi available from the city water main at the theoretical design flow (300 gpm).
- Less 10 psi safety cushion required by City of Evanston Code Amendments.

- Less approximately 8 psi pressure loss through backflow preventor.
- Less approximately 15 psi elevation loss to highest sprinkler.
- Less approximately 7 psi minimum required at end sprinkler.

Equals: no pressure available for system friction losses in above ground and underground piping. Normally between 15 psi to 30 psi is needed for system pipe friction losses, but this can be reduced to 5 to 10 psi by "oversizing" the pipe.

Tamper switches have not been provided on the two gate valves on the incoming fire protection service. A chain and lock have been provided.

The main 4" sprinkler riser is provided with a flow switch connected to a 6" inside electric alarm bell and a 10" outside electric alarm bell, all of which appear to have been installed with the original 1974 construction.

Fire extinguishers are provided at various locations throughout the building. Fire extinguishers are mounted in recessed cabinets in finished spaces and on mounting brackets in mechanical rooms.

Photo FP-4: Waterflow switch on sprinkler riser.

Conclusions

Sprinkler system requires multiple upgrades in order to be in conformance with the current building code, amendments and good engineering practices.

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
FIRE PROTECTION								
4" Check Valve	Satisfactory	1	26	50	24		--	(3)
4" Gate Valves	Satisfactory	2	26	50	24		--	(3) At Check Valve
Siamese	Satisfactory	1	26	In excess of 50	24+	--		(3)
Flow Switch	Satisfactory	1	26	25	1			(3)
Piping	Satisfactory	Syst	26	In excess of 50	24+			(3) Repairs
Alarm Bells	Satisfactory	2	26	25	1		--	
Sprinkler Heads	Satisfactory	Each	26	In excess of 50	24+		--	(3) Repairs

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
FIRE PROTECTION								
Fire Ext. Cab	--	6	0		1		--	
Water Ext.	Satisfactory	1	26	10	1		--	
System Piping	--	Lot	0	50	24		--	Includes Demo (3)
Fire Pump	--	--	--	--	--		--	Includes Demo (3)
Fire Alarm	--	--	--	--	--		--	Includes Demo (3)

FIRE PROTECTION SUBTOTAL -
(immediate needs)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 9
Roofing

ROOFING

Overview

The original roof was installed in 1974. All of the roof areas were re-roofed in 1991, however, the skylights were not replaced. The new mineral surfaced modified bitumen membrane was manufactured by Siplast. Siplast issued a ten-year warranty, but it has expired. The 1991 re-roofing project was designed by PSI. The roofing contractor that installed the new roof is no longer in business.

Photo R-1: General view of a portion of the lower roof areas.

The 1991 roof was insulated with phenolic insulation manufactured by Johns Manville. Phenolic is a plastic foam insulation that is no longer manufactured in North America. Leachate from wet phenolic insulation is very corrosive. When wet phenolic insulation is in contact with prime-painted steel deck (which is the type of deck on this building), serious deck corrosion can rapidly occur.

The City of Evanston filed a claim with Johns Manville pertaining to the phenolic insulation. Johns Manville recently settled the claim with the City.

The purpose of the roof investigation was to ascertain the condition of the existing roof assembly and determine if roof repair or replacement is needed, and if so, identify potential solutions and make recommendations.

Potential solutions and recommendations will be presented in the Phase II Report.

Investigation Methods

The investigation process consisted of the following:

- Review of the original roof plan and details (drawings A10 and A11, dated 2/27/74).

- Review of the 11/19/98 roof inspection report prepared by Johns Manville.

- Discussed the roof history with Charles Davis (Building Supervisor), Bob Dorneker (Superintendent Recreation) and Frank Kassen (Facilities Management Construction Manager).

- Visually observed virtually all of the ceilings throughout the facility for signs of water stains. Where water stained ceiling boards were observed, the space above the ceiling was observed to determine if the water had likely entered from the roof or other items such as piping.

- All six roof areas and all of the skylights were observed to assess their general condition.

- The perimeter of each roof area was checked for moisture with an electrical capacitance moisture meter.[1] Measurements were taken about every five feet.

- The field of roof area A and B (see RSK-1) was checked for moisture with an electrical capacitance moisture meter on a grid measuring approximately 6' by 5'.

- I walked along lines that were 9' apart in the field of roof areas C and F. The purpose of this task was to check for soft spongy areas. Where soft areas were detected, the area was checked for moisture with an electrical capacitance moisture meter.

- A single test cut measuring approximately 4" x 4" was taken at each roof area, except for area A. At area A, one 24" x 24" and four 4" x 4" test cuts were taken.

Footnote: 1- An electrical capacitance meter does not indicate a material's moisture content; it simply gives a relative reading.

- Temperature and humidity measurements were taken in the skating rink and the studio rink, using a digital psychrometer.

- Dew-point calculations were performed using *RoofWise*, a computer program developed by the National Roofing Contractors Association.

Observations

The field investigation was performed on July 9, 2002. The following subsections describe noteworthy observations.

Interior Leakage

Mr. Davis advised that rain had fallen the evening before, and that water had leaked into the building near the northwest corner of the main skylight (Photo R-2). Mr. Davis also advised that the barrel vault skylight had leaked in the past, but leakage was not apparent that morning. Mr. Dorneker advised that the pyramidal skylights at the entry canopy had leaked in the past. He reported that water traveled along the deck flutes, towards the entry (Vest. A101), where it dripped into the building. Leakage from the pyramidal skylights was not apparent that morning. Skylight leakage is discussed later in this section.

A few stained ceiling tiles were found in the following rooms: Multi-purpose Room A/B A103, Dance Studio Room E (A124) and Skates A132 (Photo R-3). The staining at rooms A124 and A132 appeared to be associated with leakage from the main skylight. The roof near the low end of the main skylight (i.e., above room A132) was checked for moisture with the moisture meter. Several high readings were made, and test cut #2 revealed water-saturated insulation (as described later in this section). The roof along the base of the sloped skylight wall (which was above the stained ceiling boards in room A124) was also checked for moisture with the moisture meter, but moisture was not detected.

Photo R-2: View of leakage area at the northwest corner of the main skylight.

Below the northwest corner of the skylight, the board that shielded the wall-mounted light fixtures (Photo R-2) was deteriorated due to water leakage from the skylight. The extent of deterioration indicated that leakage in this area had been periodically occurring for an extended time period.

Test Cuts

Test cut locations are shown on RSK-1. Findings from the test cuts were as follows:

#1: The roof system was constructed as follows: 2-ply modified bitumen membrane, 1" perlite insulation, 1 ½" phenolic insulation, built-up membrane, ¾" to 1" rigid fiberglass, kraft paper vapor retarder and steel deck (Photo R-4).

Before cutting the sample, a moderately high reading was found with the moisture meter. After cutting the sample, damp perlite insulation was found.

#2: The roof system was constructed the same as sample #1. However, with this larger sample, it was found that the phenolic was mechanically fastened, and that the kraft paper was adhered to the deck in ribbons of adhesive (Photo R-5).

Water occurred in an interply void between the base and cap sheets. The perlite was damp and mushy, and the phenolic was saturated with water. However, the rigid fiberglass insulation below the built-up membrane was dry.

The steel roof deck was superficially corroded, which is common with prime-painted decking (Photos R-6 and R-7).

Before cutting the sample, a maximum reading was found with the moisture meter.

#3: The roof system was constructed the same as sample #1. The perlite was damp and

Photo R-3: View of stained ceiling boards in room A132.

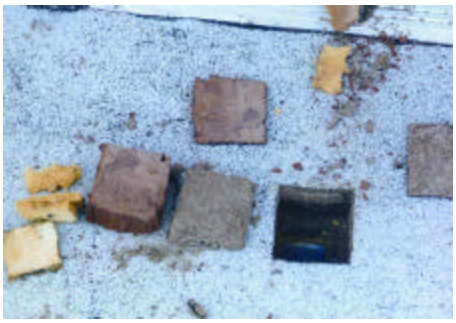


Photo R-4: Components left to right: Rigid fiberglass, phenolic, perlite, built-up membrane (above the perlite), sample opening, modified bitumen membrane.

Photo R-5: General view of test cut #2. The main skylight is in the background.

mushy, and the phenolic was saturated with water. However, the rigid fiberglass insulation below the built-up membrane was dry.

Before cutting the sample, a moderately high reading was found with the moisture meter.

#4: The roof system was constructed as follows: 2-ply modified bitumen membrane, 1" perlite insulation, built-up membrane, ¾" to 1" rigid fiberglass insulation, tapered fill (which appeared to be gypsum).

Before cutting the sample, a moderately high reading was found with the moisture meter. After cutting the sample, damp and mushy perlite insulation was found. However, the tapered fill was dry.

#5: The roof system was constructed the same as sample #1. The perlite was slightly damp on the side adjacent to the phenolic. The bottom side of the phenolic was damp, and when pressed, water oozed from the insulation. The surface of the built-up membrane adjacent to the phenolic had surface moisture on it. However, the rigid fiberglass insulation below the built-up membrane was dry.

Before cutting the sample, a moderate reading was found with the moisture meter.

#6: The roof system was constructed the same as sample #1. The perlite, phenolic and rigid fiberglass were dry.

#7: The roof system was constructed as follows: 2-ply modified bitumen membrane, 1" perlite insulation and built-up membrane. Construction below the built-up membrane was not determined because of the presence of water.

Water occurred in an interply void (Photo R-8). The cap sheet was removed at the void area, so that the water could be drained (Photo R-9).

Photo R-6: Close-up of test-cut #2. The black ribbon on the deck is adhesive.

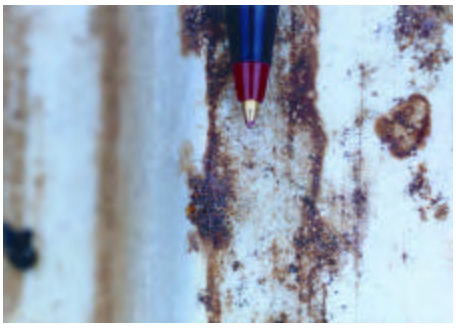


Photo R-7: Close up of test-cut #2, showing superficially corroded steel deck (the tip of the ink pen shows the scale of the photo).

Before cutting the sample, a maximum reading was found with the moisture meter. However, because the water was only in the interply void, the perlite was dry.

#8: The roof system was constructed the same as sample #1. The perlite, phenolic and rigid fiberglass were dry.

#9: The roof system was constructed the same as sample #1, except that the deck was an acoustical deck and fiberglass batt insulation occurred in the flutes.

The sample was taken at an interply blister, which had a minor amount of surface moisture in it.

Before cutting the sample, nearly a maximum reading was found with the moisture meter. However, because the water was only in the interplay void, the perlite and phenolic were dry (as well as the rigid and batt fiberglass). (Note: The moisture meter is very sensitive to moisture near the top of the sample. It is for this reason that a very high reading was obtained, yet a minor amount of moisture was found.)

#10: This roof assembly was constructed the same as sample #9. The perlite was very damp and crumbled when it was removed. The phenolic was moist. However, the rigid and batt fiberglass were dry.

Before cutting the sample, nearly a maximum reading was found with the moisture meter.

All of the samples were repaired by a Siplast authorized roofing contractor.

Moisture Meter Testing

High moisture readings were found at many locations on Roof A. The moisture was likely caused by leakage from the main skylight and the pyramidal skylights. High readings were also found at a single location on Roof C and E.

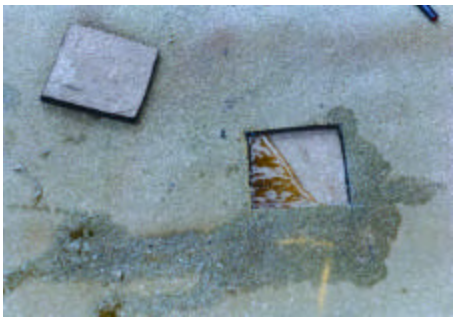


Photo R8: View of test cut #7, after removal of the modified bitumen membrane. Note the water at the left portion of the sample.

Photo R9: View of test cut #7 after removal of the membrane and perlite. Water may have migrated from the wall cracks (upper center).

Photo R-10: View of a blister on Roof E.

The moisture at Roof C was likely caused by water infiltration at the large wall cracks shown in Photo R-9. The moisture at Roof E was likely entrapped between the base and cap sheets during roof construction.

High moisture readings were also found at Roof F in an area along the east wall. The area was about 2' wide and 12' long, beginning at the south end of the wall. The moisture was likely caused by water infiltration at large wall cracks.

General Observations

The modified bitumen cap sheet appeared to be in very good condition. Visual observation indicated that the seam integrity and general workmanship appeared to be good.

Very few blisters were observed. All but one of the observed blisters were quite small and of the nature that would typically be expected to occur on a modified bitumen membrane roof. The largest blister occurred on Roof E (Photo R-10). The blister was about 4' long and occurred along a seam.

Johns Manville took several test cuts through the roof in 1998 to check the condition of the metal roof deck. The sample locations were patched (e.g., the black round areas in the foreground of Photo R-1). However, an inappropriate repair technique was used. The samples were patched with asphalt roof cement, rather than a Siplast base and cap sheet. Patches made with Siplast materials offer a longer service life.

In some areas, the sealer in the pitch pockets around the canopy cable anchors had lost the bond to the anchor (Photo R-11). In other areas, the sealer had lost the bond to the pocket itself.

In several areas, the sealant between the wall and the metal counter-flashing had de-bonded (Photo R-12). At the area shown in Photo R-12, water could enter the cracked mortar joint and

Photo R-11: The putty knife is in an opening in the pitch pocket sealer. Photo R-1 shows where the pitch pockets occur.

Photo R-12: The putty knife is in an opening where the sealant is no longer bonded. Note the cracked mortar joint.

Photo R-13: The storm collar was not sealed to the flue.

flow down behind the metal counter-flashing and membrane base flashing that was underneath the counter-flashing.

The storm collar at a flue was not sealed to the flue pipe (Photo R-13).

In one area on Roof D and at a few locations on the sloping diagonal wall at the main skylight, a portion of the coping had detached from the clips that attached it to the parapet (Photo R-14 and R-15).

Photo R-14: General view of the main skylight. The coping on the diagonal wall was loose.

Skylights

The main skylight (Photo R-14) has a drainage channel along the low end of the skylight. The drainage channel collects condensation that occurs on the underside of the skylight, as well as water that infiltrates at worn gaskets. The drainage channel has weep holes for drainage. However, the holes provide inadequate drainage. Also, a sill flashing below the drainage channel can collect water, but there is not a pathway to the exterior for drainage of water that it collects.

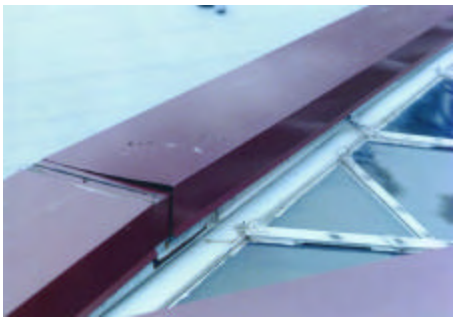


Photo R-15: Close-up of loose coping on the sloped diagonal wall of the skylight.

At the wall, the skylight counter-flashing sits in a raggle (slot cut into the wall). However, the underlying skylight flashing leg is not sealed to the wall (Photo R-16). Because the leg is unsealed, air flows from within the building. The airflow wastes energy, and in winter can cause condensation to occur on the underside of the counter-flashing, which can then leak past the flashing leg and run into the building.

The low end of the skylight is not anchored. Very high winds could lift the skylight. However, there were no indications of previous wind uplift.

Photo R-16: View of the counterflashing at the main skylight. A putty knife is in the unsealed opening between the wall and the flashing leg.

The plastic glazing at the barrel vault skylight is craze-cracked (Photo R-17) and the gaskets are very weathered. The gaskets are also very weathered at the pyramidal skylights. Sealant

had been applied at several of the pyramidal skylight gaskets in an apparent attempt to stop leakage. Also, a skylight flashing flange was cut in order to fit around a canopy cable anchor pitch pocket.

Photo R17: Close-up of crazed-crack glazing at the barrel vault skylight.

Conclusions

Large areas of Roof A are wet. Minor amounts of moisture within the roof system were found at isolated locations on Roof C, E and F. Because moisture was checked on a grid layout, moisture may occur in locations that were not checked, but if it occurs, the wet areas are not large.

With the exception of Roof A, the roof membrane should be capable of offering in excess of 10 more years of useful service life.

Because a built-up membrane occurs beneath the phenolic insulation, leachate from wet phenolic is prevented from reaching and corroding the steel deck.
The skylight leakage is caused by worn glazing gaskets, and in the case of the main skylight, by inadequate weepage paths, an unsealed flashing at the wall and water entry at the sloped copings.

The copings are vulnerable to blow-off during strong winds.

Remedial work is needed to address the skylight leakage, inadequate skylight uplift resistance, loose copings, and moisture within the roof system.

Dew-point calculations revealed that condensation does not occur on the underside of the roof deck. Visual observations of the roof deck support the dew-point analysis.

Section 10

Ice Rink – Refrigeration

ICE RINK - REFRIGERATION

Overview

The refrigeration system serving the ice rink contains three (3) reciprocating refrigerant compressors, each of which is outfitted with a 100 horsepower electric motor. A condenser water cooling system, with cooling tower, serves to reject heat from the compressor units. The refrigerant system is used to cool an ethylene glycol / water solution that is, in turn, circulated to the ice rink in order to create and maintain an ice slab. The refrigeration system has design flaws that have limited its efficiency for the life of the system.

Photo RF-1: Compressors.

Investigation Methods

A survey of the existing Robert Crown Center ice rink system was conducted and included a visual observation of equipment operation as well as ice slab quality before and after resurfacing. In addition, the requirements of the local and national building and safety codes were reviewed relative to the installed refrigeration system. The following narrative provides an overview of our observations.

Photo RF-2: Cooling Tower.

Observations

The compressors that serve the refrigeration system contain water cooled condensers and fluid coolers for the ethylene glycol / water solution. These compressors were manufactured by Vilter of Milwaukee, Wisconsin and packaged with the condenser and fluid cooler by Beltz of Detroit, Michigan.

The compressors themselves are in reasonable good operating condition and can be expected to provide up to another 5 years of reliable service given the proper and continuous maintenance.

The condenser and fluid cooler that were provided, with each compressor, are not configured to provide optimum performance. The area of heat transfer surface contained in each of these units is at least 50% less than would be used in a comparable rink built today. The result of having more heat transfer surface will be a reduction in the amount of energy consumed by the compressors units during each hour of operation.

Several tubes in the condenser and fluid cooler bundles have ruptured and been plugged. This action further reduces the heat transfer area available to the refrigerant and, therefore, increases the power consumption required to maintain the ice slab.

Due to lack of refrigerant storage space within the refrigeration systems, the charge must be changed from the summer months to the winter months in order to achieve optimum performance and to maintain the ice slab in certain situations. The current operating plan is to keep the charge the same, both summer and winter, thus sacrificing efficiency but reducing the use of refrigerant and the time required to drain it from and add it to the refrigerant systems.

The cooling tower is new within the last 2 years but much debris has been allowed to accumulate in the outside basin. This debris indicates that there may be some fouling of the condenser heat transfer surfaces; thus, further reducing the system efficiency.

The ice slab is held at 1½" to 2" of thickness. The normal recommended thickness of 1" to 1¼" requires less compressor energy to maintain due to the reduced resistance to heat transfer afforded by the thinner ice. Lowering the ice thickness will reduce the time required to recover from each ice resurfacing effort.

The condition of the under-floor pipe distribution system cannot be fully determined without extensive destructive testing. The entire rink slab

Photo RF-3: Circulating pumps.

was visually inspected and no evidence of leakage (presence of a pink substance in either liquid or solid state) from the pipe distribution system was found. Further, the service mechanic from AMS related that there have been no recent incidents of pipe leaks in the area of the rink slab. The fact that the internal piping system pressure is maintained at a consistent value supports the reasonable assumption that the mechanical integrity of the pipe distribution system is intact.

There is no emergency ventilation system for the refrigeration machinery room and there are no refrigerant monitors present. The doors leading to the rest of the building are not air tight, there is no emergency breathing apparatus, and there are no signs posted indicating the amount and type of refrigerant present in the machinery room. Each of these issues falls outside of the accepted standards and safety codes for installation of a refrigeration machinery room.

Photo RF-4: Main Ice Rink.

Conclusions

The refrigeration system is functional but is inefficient, non-compliant to safety codes, and requires an excessive amount of annual service from highly trained and expensive technicians.

The issues affecting the refrigerant machinery room safety must be brought into compliance as soon as possible. Further, it is recommended that the compressors and heat transfer units be replaced to reduce electric operating costs by approximately 30% per annum.

FACILITY ASSESSMENT
REFRIGERATION EQUIPMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
Manning Model 20 Gas Detector	New		0	30	30			New – Required by Code
Vent System	New		0	30	30			New – Required by Code
Compressor Units		3	29	24	2-3			
Cooling Tower	Satisfactory	1	2	17	15			New – Debris in Sump
Sump (Indoor)	Satisfactory	1	Unknown	20	Unknown			
Circulating Pumps	Satisfactory	4	29	30	2-3			

REFRIGERATION SUBTOTAL -
(immediate needs)

1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 11
Geotechnical

O'BRIEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
1235 E. DAVIS ST/ARLINGTON HTS, IL 60005
[847] 398-1441 • FAX [847] 398-2376

September 24, 2002

A. Epstein and Sons International, Inc.
600 West Fulton
Chicago, Illinois 60661-1199

Attention: Mr. Gary Cooper

Job No. 02255

Re: Settlement Investigation
East Foundation Wall
Robert Crown Center
Evanston, Illinois

Dear Mr. Cooper:

The following report presents the results of the settlement investigation performed at the above site. This report has been based upon information regarding the settlement that has occurred in the building and subsurface information obtained in three (3) borings.

The existing building was constructed in 1975 and apparent differential movement (settlement) has occurred along the east wall. According to the building design plans, the building is supported on 3'-0" wide footings situated at a depth of 3'-6" below the ground surface.

The purpose of this report is to describe the subsurface conditions encountered in the borings, to analyze and evaluate the data obtained, and to submit recommendations relative to appropriate remedial measures.

Boring locations were determined by O'Brien & Associates, Inc. field personnel based on a location diagram provided to our office. The soil borings were performed on August 9, 2002, with a CME-55 drilling rig and were advanced by means of hollow stem augers. Representative samples were obtained employing split spoon sampling procedures in accordance with ASTM Specification D-1586. Samples obtained in the field were returned to our laboratory for further examination and testing.

The testing program consisted of performing water content, density and either unconfined compression or calibrated penetrometer tests on the cohesive samples recovered. Water content tests were performed on the non-cohesive samples recovered. These tests were performed upon representative portions of the samples obtained in the field. The results of all testing performed, along with a visual classification of the material based upon both a textural analysis and the Unified Soil Classification System, are indicated on the boring logs.

Specific soil conditions encountered in the borings are indicated on the soil boring logs. As indicated on the logs, fill materials were encountered below the existing pavement and the fill materials extended to a depth of 3.5' below ground surface. The fill was underlain by very loose to medium dense, silt and sand soils that extended to a depth of 6.0' to 13.5' below ground surface. The silt soil encountered in boring B-3 was noted to be slightly organic, with moisture contents above 28%. In boring B-2, an organic clay with sand streaks was encountered from 6.0' to 8.5' below ground surface. Stiff to hard clay soils were encountered below the sand, silt

and organic clay, and extended to a depth of 16.0' below ground surface. Very soft to soft silty clay soils were encountered at a depth of 16.0' and these softer clay soils extended to the maximum depth of the borings, 30.0' below ground surface. The stratification lines shown on the boring logs represent the approximate boundary between soil types, and the actual transition may be gradual.

Water level readings were taken during drilling and after the completion of the borings. Groundwater was encountered at a depth of 15.0' during the drilling operation. After completion of the borings, water was noted at a depth of 3.5' in borings B-1 and B-2, and boring B-3 was noted to be dry. These readings are shown on the boring logs and, along with local hydrogeologic information, indicate that the phreatic surface is at or below a depth of approximately 10.0' below the existing ground surface. Fluctuations in the amount of water accumulated and in the hydrostatic water table can be anticipated depending upon variations in precipitation and surface runoff. The water level observations provide an approximate indication of the groundwater levels at the time the borings were drilled. Longer term observations using piezometers would be necessary to more accurately establish groundwater conditions at the site.

The results of the borings indicate the presence of high moisture content, very loose to loose silt, sands and clay soils with organics below the expected foundation level. Based on the results of the borings, the observed settlement appears to be from desiccation and/or consolidation of these high moisture content and slightly organic soils. Because of the moisture content of the soils and the organics noted within the soils, some additional settlement is possible.

Remedial measures can consist of the installation of an underpinnning system along the east wall. However, considering the age of the structure and magnitude of settlement that has occurred to date, we do not expect significant additional settlement to occur and, prior to underpinning the structure, we recommend that a settlement monitoring program be established. The monitoring program should consist of establishing several permanent settlement points or marks on the wall and monitoring the settlement on a monthly or bi-monthly basis over an extended period (a minimum of 6 months to 1 year). If detrimental movement of the wall continues, an underpinning program can then be considered.

The underpinning system can consist of driving steel pipe piles or drilling helical piers and attaching the pile or pier to the foundation wall with a steel support bracket. It may also be possible to raise and/or relevel the foundation wall during the underpinning process. For the design of an underpinning system, we recommend that additional deeper borings be performed. Additional borings should also be performed along the north and south walls to determine if compressible soils are present below these wall. If the entire building is settling, the underpinning may have the effect of arresting settlement along the south wall, but also causing distress in the north and south walls if additional settlement occurs below these walls.

The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations which may occur between borings or across the site. In addition, the soil samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will

Job No. 02255

be necessary to reevaluate the recommendations of the report.

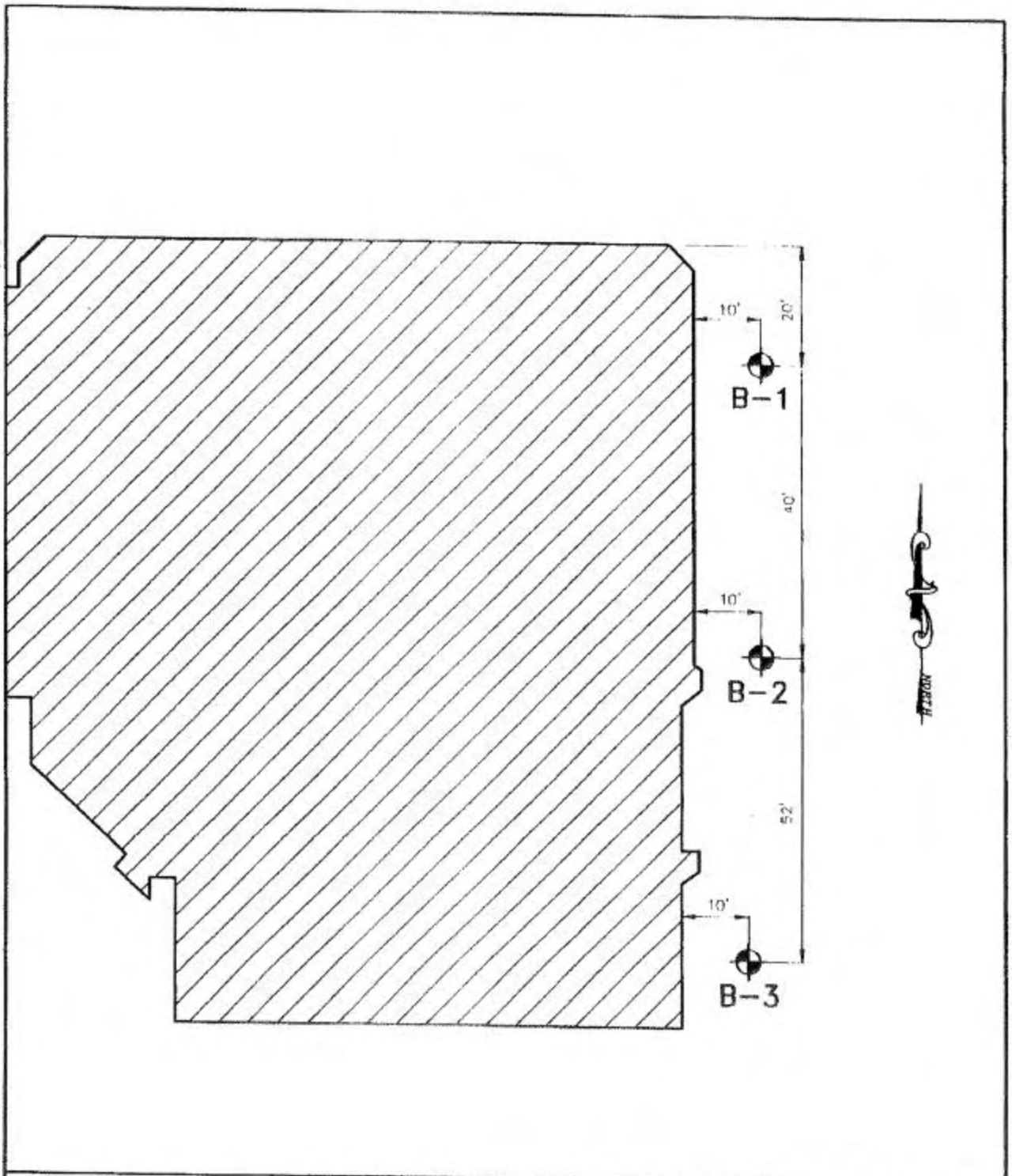
This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are intended or made. Also note that O'Brien & Associates, Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of the report's' subsurface data or engineering analyses without the express written authorization of O'Brien & Associates, Inc.

If there are any questions with regard to the information submitted, please do not hesitate to contact me.

Very truly yours,

O'BRIEN & ASSOCIATES, INC.

Dixon O'Brien, P.E.
Vice President
DOB/jh
enc.



BORING LOCATION DIAGRAM

Foundation Wall Investigation
for the
Robert Crown Center
1701 W. Main Street,
Evanston, Illinois

OBA
O'BRIEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
1235 E. DAVIS ST./ARLINGTON HTS., IL 60005
(847)398-1441 * FAX(847) 398-7376

DRAWN BY	RWC
APPROVED BY	DOB
DATE	8-14-02
JOB NO.	02255
SCALE	NTS

O'BRIEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
1239 E. DAVIS ST./ARLINGTON HTS., IL 60005
(847)398-1461 * FAX(847) 398-2378

STRUCTURE FOUNDATION BORING LOG

Sh 1 of 1

Project: Robert Crown Center–East Foundation Wall Investigation
Location: 1701 W. Main Street, Evanston, Illinois
County: Cook
Client: A. Epstein & Sons International, Inc.

OBA JOB NO. 02255
Date August 9, 2002
Bored By RH
Checked By DOB

BORING No.: B-1
Location: 20' south of the north wall
10' east of the east wall

Ground Surface Elevation +18.3 CCD

Surface Water Elev. n/a
Groundwater Elevation +14.8 WD
Groundwater Elevation +3.3 AB
After Hours

Elev.	Description	Blow Counts	Qu (tsf)	W (%)
	3.0" ASPHALT, 9.0" CRUSHED STONE			
	SILTY SAND–trace to some gravel and cinders–black–loose (Fill)	3		
		3		
		5	NP	26
	SILTY CLAY to CLAYEY SILT–trace organics–brown and gray–very soft (CL/ML) Wet	1		
		1		
−5		2	<0.25F	34
	CLAYEY SILT–trace fine sand–gray–very loose (ML)	0		
		1		
		1	NP	26
	SILTY FINE SAND–trace gravel–gray–very loose (SM)	1		
−10		1	NP	22
	SILTY CLAY–trace sand and gravel–gray–hard (CL)	3		103
		4		
		7	4.0B	21
	SILTY CLAY–trace sand and gravel–gray–stiff (CL) Wet ▼	2		95
−15		3		
		4	1.5B	26
	SILTY CLAY–trace sand and gravel–gray–very soft (CL) Wet	1		
		1		
		2	<0.25F	31
		0		
−20		0		
		0	<0.25F	38
		0		
		0		
		0	<0.25F	37
		0		
		1		
−25		2	<0.25F	35

Elev.	Description	Blow Counts	Qu (tsf)	W (%)
	SILTY CLAY–trace sand and gravel–gray–very soft (CL) Wet	0		
		0		
		0	<0.25F	31
		0		
		0		
−30		0	<0.25F	45
	End of Boring @ −30.0' Hollow Stem Augers CME Automatic Hammer			
−35				
−40				
−45				
−50				

N: Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D-1586)
NR: No Recovery

Type Failure
B: Bulge Failure S: Shear Failure
E: Estimated Value P: Penetrometer

Qu–Unconfined Compressive Strength (tsf)
W: Water Content, percent dry weight
NP: Non-Plastic

Unit dry weight (pcf) noted in italics above w%

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OBA

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STRUCTURE FOUNDATION BORING LOG

Sh 1 of 1

Project: Robert Crown Center–East Foundation Wall Investigation
Location: 1701 W. Main Street, Evanston, Illinois
County: Cook
Client: A. Epstein & Sons International, Inc.

OBA JOB NO. 02255
Date August 9, 2002
Bored By RH
Checked By DOB

BORING No.: **B-2**
Location: 60' south of the north wall 10' east of the east wall

Ground Surface Elevation + 18.3 CCD

Surface Water Elev. n/a
Groundwater Elevation + 14.8 WD
Groundwater Elevation + 3.3 AR
After Hours

	Blow Counts	Qu (tsf)	W (%)
4.0" ASPHALT, 8.0" CRUSHED STONE			
	6		
TOPSOIL with SAND and CINDERS–black (Fill)	2		
	2	–	28
▽			
	0		
CLAYEY SANDY SILT–trace gravel–brown and gray–very loose (ML)	1		
–5	1	NP	26
	0		
SILTY CLAY with SAND STREAKS–some organics–brown and gray–very soft (OL) Wet	0		
	0	<0.25P	43
	4		
	4		
–10	3	1.5P	23
SILTY CLAY–trace sand and gravel–gray–stiff (CL)	2		99
	2		
	3	1.6B	25
	2		96
	3		
▼ –15	3	1.8B	24
	0		
	0		
	1	<0.25P	32
	0		
	0		
SILTY CLAY–trace sand and gravel–gray–very soft (CL) Wet	–20 0	<0.25P	28
	0		
	0		
	0	<0.25P	33
	0		
	0		
	–25 0	<0.25P	35

	Blow Counts	Qu (tsf)	W (%)
	0		
SILTY CLAY–trace sand and gravel–gray–very soft (CL) Wet	0		
	0	<0.25P	25
	0		
	0		
–30	0		NR
End of Boring @ –30.0'			
Hollow Stem Augers			
CME Automatic Hammer			
–35			
–40			
–45			
–50			

N Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D 1586)
NR No Recovery

Type Failure
B Bulge Failure S-Shear Failure
E-Estimated Value P Penetrometer

Qu-Unconfined Compressive Strength (tsf)
W-Water Content, percent dry weight
NP Non-Plastic

Unit dry weight (pcf) noted in italics above w%

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STRUCTURE FOUNDATION BORING LOG

Sh 1 of 1

Project: Robert Crown Center–East Foundation Wall Investigation
Location: 1701 W. Main Street, Evanston, Illinois
County: Cook
Client: A. Epstein & Sons International, Inc.

OBA JOB NO. 02255
Date August 9, 2002
Bored By RH
Checked By DOB

BORING No.: **B-3**
Location: 112' south of the north wall 10' east of the east wall

Surface Water Elev. n/a
Groundwater Elevation +14.8 WD
Groundwater Elevation Dry AB
After Hours

Ground Surface Elevation +18.3 CCD

Elev.	Blow Counts	Qu (tsf)	W (%)
	4.0" ASPHALT, 8.0" CRUSHED STONE		
	6		
	SANDY TOPSOIL with CINDERS–black–very loose (Fill) 2 1	--	38
	▽ 0		
	1		
-5	CLAYEY SANDY SILT–trace to some organics–brown and gray–very loose (ML/OL) 1	NP	28
	0		
	0		
	0	<0.25P	42
	3		
	SILTY FINE SAND–trace gravel–gray–medium dense (SM) 6		
-10	5	NP	23
	2		
	CLAYEY SILT–gray–loose (ML) 2		
	2	NP	24
	3		94
	SILTY CLAY–trace sand and gravel–gray–very stiff (CL) 4		
-15	6	2.0B	25
	1		87
	2		
	1	0.25B	34
	SILTY CLAY–trace sand and gravel–gray–very soft to soft (CL) Wet 0		
	0		
-20	0	<0.25P	33
	0		
	0		
	1	<0.25P	32
	0		
	0		
-25	1	<0.25P	42

Elev.	Blow Counts	Qu (tsf)	W (%)
	SILTY CLAY–trace sand and gravel–gray–very soft to soft (CL) Wet 0		
	0		
	0	<0.25P	45
	0		
	0		
-30	0	<0.25P	44
	End of Boring @ -30.0' Hollow Stem Augers CME Automatic Hammer		
-35			
-40			
-45			
-50			

N-Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D 1586)
NR-No Recovery

Type Failure
B-Bulge Failure S-Shear Failure
E-Estimated Value P-Penetrometer

Qu-Unconfined Compressive Strength(tsf)
W-Water Content, percent dry weight
NP-Non-Plastic

Unit dry weight (pcf) noted in italics above w%

O'BRIEN & ASSOCIATES, INC.

ROBERT CROWN CENTER AND ICE RINK COMPLEX

EVALUATION OF EXISTING FACILITY AND INFRASTRUCTURE REPORT
PHASE II – RECOMMENDATIONS REPORT

Table of Contents

Section 1

Phase II Recommendations

General Comments

Phase II Recommendations – General Comments

Based on the Phase I observations, each discipline has developed a scope of work for improvements to the Robert Crown Center. Rather than list the scope of work according to each building trade, the suggested improvements are outlined by specific project. These projects are dictated by a combination of adherence to the building code and wear and tear on the physical elements of the structure itself. The architectural, civil, structural, roofing, and refrigeration disciplines follow this "project specific" estimating method.

These improvements represent "in-kind" replacement of items that have outlived their useful life, or changes in the building plans to accommodate specific code requirements. They do not reflect any space added to the building or changes in the current programmatic agenda of the Robert Crown Center.

Unlike the "project-specific" estimate generated by architecture (et. al), the engineering disciplines, by their very nature require a "systems" approach to estimating. Therefore, HVAC, Fire Protection, Plumbing and Electrical have generated their estimates based on code-required or age-related improvements to their individual systems. To accomplish their estimates, each discipline surveyed all operating pieces of equipment in the building and evaluated each item as to its remaining useful life, code compliance, and corresponding replacement cost. Those surveys resulted in the cost estimates contained in this report. Each individual discipline has outlined a scope of work and detailed costs reflecting the required improvements. At the conclusion of the Phase II Report is a **Cost Items Summary Sheet** outlining the total cost estimates for required improvements to the Robert Crown Center. The cost estimate reflects the sum of items which need immediate replacement and items which will require replacement or renovation in five years or less. A line item for items requiring replacing or repair at ten years is also provided.

The Immediate Needs Cost detailed in this Phase II Report, in combination with the Ten Year Needs Costs, will extend the useful physical life of the Robert Crown Center by an additional 15 to 17 years.

Please note: A hazardous materials survey is not part of the Scope of Work of this study and, as such, is not reflected in the observations or their associated cost estimates. It is recommended that such a survey be conducted by a qualified environmental survey firm and a report with associated costs for remediation be submitted to the City of Evanston.

Section 2

Phase II – Architectural Recommendations

Phase II – Architectural Recommendations

Scope of Work

A. Site Work/Building Entry

1. Excavate detention area and construct landscaped earth berm. See sketch CSK-1.
2. Provide 12" underground drain pipe and catch basin and connect to existing drainage tunnel. See sketch CSK-1.
3. Provide new curb ramps with detectable warning at west parking lot.
4. Provide new parking lot lighting fixtures (included in Electrical).
5. Demolish existing exterior concrete slab at east end of main concourse area and replace with new slab.
6. Demolish existing handicap ramp at main entry and replace with new concrete ADA compliant access ramp.
7. Re-grade north side of building to drain water away from masonry wall.
8. Provide 3' wide x 18" deep, new gravel strip at north wall.

B. Building Façade Renovation

1. Steam clean and pressure wash entire masonry façade exterior. Remove "graffiti block" product.
2. Paint all exterior metal doors and frames and exposed steel panels, scupper boards, and louvers.
3. Paint all exposed steel beam and deck framing, and metal fascia at building entry.
4. Grind out mortar joints and re-tuckpoint masonry at areas under skylights and sloped sills. Repair cracked masonry.
5. Paint steel pipe enclosures for downspouts on north side of building.
6. 16' x 13' concrete slab replacement.
7. Re-seal control joints
8. Install new handrail at east concrete wall.

C. Classroom Renovations

Multipurpose Room A/B - A-103

1. Remodel entry door area to Multipurpose Room A/B to comply with ADA.
2. Install new acoustical tile ceiling.
3. Paint doors and frames.
4. Paint interior walls – CMU
5. Replace cracked floor tile (allowance 10% of floor area)
6. Replace lighting fixtures to match existing foot candle level (included in Electrical costs).

   Option: Increase foot candle (see Electrical Cost Summary).

7. Rework mechanical ductwork/VAV boxes (included in Mechanical).

7.a Fire Protection (included in Fire Protection).

Craft Room – A-106

8. Paint interior walls of Craft Room – CMU.
9. Paint exposed ceiling structure of Craft Room.
10. Replace barrel vault skylight (included in Roofing cost).
11. Provide direct flue to outside for kiln and provide "A" label door on Kiln Room A-107.
12. Paint doors and frames.
13. Replace base cabinets in Craft Room (35 lineal feet).
14. Replace light fixtures to match existing light level (included in electrical cost) Option: Increase foot candle level (see Electrical Cost Summary).
15. Electrical work (included in Electrical cost.)
16. Rework mechanical ductwork in boxes (included in Mechanical).
17. Fire protection (included in Fire Protection).

Game Room – A-119

18 Paint interior walls of Game Room.
19. Paint hollow metal doors and frames.
20. Install new acoustical tile ceiling.
21. Replace closet bi-fold doors with lockable hollow metal doors.
22. Replace light fixtures to match existing light level (included in Electrical cost). Option: Increase foot candle level (see Electrical Cost Summary).
23. Rework mechanical (included in Mechanical).
24. Fire Protection (included in Fire Protection).

Nursery – A-124

25. Paint interior walls of Nursery.
26. Paint hollow metal doors and frames.
27. New acoustical tile ceiling.
28. Replace light fixtures to match existing light level (included in Electrical cost). Option: Increase foot candle level (see Electrical Cost Summary).
29. Rework mechanical (included in Mechanical).
30. Fire Protection (included in Fire Protection).
31. New floor in Nursery Room.

D. Kitchen – A-105

1. Remove and replace existing kitchen cabinetry with new base and upper cabinets in same configuration as existing.
2. Install additional sink with associated plumbing.
3. Install new washable mylar lay-in ceiling (demolish existing plaster ceiling)

4. Install new substrate and ceramic tile floor.
5. Paint existing walls – CMU
6. Install new lighting to match existing light level (included in Electrical). Option: Increase foot candle level (see Electrical Cost Summary).
7. Rework mechanical (included in Mechanical).
8. Fire Protection (included in Dire Protection)
9. Modify pass-thru height for ADA.

E. Men's (A-112-115) and Women's (A116-118) Locker Room

1. Demolish all existing partitions, finishes, equipment, lockers, and plumbing fixtures (retain mop sinks in janitor's closets).
2. Install 9 new toilet fixtures, 1 new urinals, 8 new lavatories, 5 new pre-molded fiberglass showers. Provide 2 new solid surface countertops. Install 60 new plastic wardrobe lockers and five, 10 foot benches. The total number of fixtures quoted above also includes fixtures required for the pre-school classrooms.
3. Paint all interior surfaces, doors and frames.
4. Wet walls to be 2" x 2" ceramic tile in shower only.
5. Provide new plaster ceilings in shower areas and new acoustical tile ceiling in locker/bathroom areas.
6. Provide new light fixtures to match existing light levels (included in Electrical).
7. Rework mechanical (included in Mechanical).
8. Fire Protection (included in Fire Protection).
9. Rework plumbing as required for new plan (included in Plumbing).
10. Install new 2" x 2" ceramic tile floor in showers.
11. Install new toilet accessories and mirrors, and grab bars.
12. Install new skate tile floor in locker rooms.

F. Offices - A-125 – A-132 and A-110

1. Install new carpet (remove existing)
2. Install new ADA hardware on doors (9 hollow metal doors).
3. Paint interior walls – CMU
4. Install new acoustical tile ceiling.
5. Modify 2 doors and surrounding partitions to be ADA compliant.
6. Modify counter height in skate rental area to be ADA compliant. Install new rolling grill.
7. Remodel employee bathrooms (rooms 129 and 130) to be ADA compliant.
8. Rework mechanical (included in Mechanical).
9. Replace lighting fixtures to match existing foot candle level (included in Electrical).
10. Fire Protection (included in Fire Protection).

G. Concession Stand - A-120 and 121

1. Modify counter height to be ADA compliant. Install new rolling grill.
2. Remove and replace base cabinetry.
3. Paint interior walls – CMU.
4. Replace existing ceiling with new acoustical lay-in ceiling.
5. Replace light fixtures to match existing light level (included in Electrical).
6. Replace existing floor with new 6"x 6" quarry tile floor.
7. Rework mechanical (included in Mechanical).
8. Fire Protection (included in Fire Protection).
9. Relocate entry to hallway.

H. Class Room Corridor – A-102
1. Replace metal ceiling with acoustical lay-in ceiling.
2. Paint CMU walls.
3. Replace light fixtures to match existing foot candle level (included in Electrical). Option: Increase foot candle level (see Electrical Cost Summary).
4. Paint window frames.
5. Rework mechanical (included in Mechanical).
6. Fire Protection (included in Fire Protection).

I. Entry Vestibule, Lobby Concourse – A-101, A-133, A-134
1. Paint interior CMU walls.
2. Replace metal ceiling with acoustical metal lay-in ceiling.
3. Paint hollow metal frames, doors, and window frames.
4. Replace skylight (included in roofing cost estimate).
5. Remove and replace skate change benches.
6. Replace lighting fixtures to match existing foot candle level (included in Electrical). Option: Increase foot candle level (see Electrical Cost Summary).
7. Rework mechanical (include in Mechanical).
8. Fire Protection (included in Fire Protection).
9. Replace hardware on vestibule entry doors and adjust and align doors.
10. Replace 30 lockers. Provide handicap accessible lockers.
11. New skate tile rubber floor.
12. Replace 5 vestibule doors.
13. Add 1 door at main entry.

J. Gymnasium – A-109
1. Paint interior CMU walls.
2. Paint exposed structure and metal deck ceiling.
3. Fire Protection (included in Fire Protection).
4. Mechanical (included in Mechanical).
5. Lighting - no upgrade in foot candle level is required.
6. Paint hollow metal doors and frames.
7. Add 1 exit door.

8. Reverse door swings at main entry.
9. Gym floor replacement.

K. Team Rooms - B-121, B-118, B-112, B-109, B-119, B-120, B-110, B-111

1. Paint interior CMU walls and concrete ceiling.
2. Replace wood benches.
3. New skate tile rubber floor.
4. Replace light fixtures to match existing foot candle levels (included in Electrical). Option: Increase foot candle level (see Electrical Cost Summary).
5. Fire Protection (included in Fire Protection).
6. Remodel CMU entry to comply with handicap code.
7. Provide ADA compliant door hardware.
8. Remodel shower/toilet area to comply with ADA:
    a. Reverse Team Room door swings
    b. Demolish existing plumbing fixtures
    c. Provide one handicap toilet and 2 urinals.
    d. Provide 2 handicap lavatories and one prefab handicap shower.
    e. Finish new bath room with new skate tile rubber floor. Shower to receive ceramic tile.
    f. Provide new plastic toilet partitions, accessories, mirror and grab bars.
9. Rework mechanical (included in Mechanical).

L & M. Public Washrooms – B-117, B-116, B-115, B-113

1. Demolish interior of existing instructor and staff rooms (B-116 and B-115).
2. Demolish interiors of existing men's and women's bathrooms (B-117 and B-113).
3. Combine Staff and Storage Room (B-115) and the existing Women's Room (B-113) into one larger women's bathroom.
4. Combine the Instructor's Room (B-116) and the existing Men's Room (B-117) into one larger men's bathroom.
5. Paint interior of bathrooms including concrete ceiling.
6. Provide new "skate tile" rubber flooring.
7. Provide new ceramic tile on wet walls.
8. Provide new metal toilet partitions, countertops, mirrors, and bathroom accessories.
9. Provide new doors and hardware.
10. Provide new plumbing fixtures including 9 toilets, 3 urinals, 6 lavatories, 2 countertops, and 2 handicap sinks.
11. Provide new plumbing connected to existing to service the new washrooms (included in Plumbing).
12. Provide new electrical (included in Electrical).
13. Provide new lighting (included in Electrical).
14. Fire Protection (included in Fire Protection).

15. Provide new mechanical to service restrooms (included in Mechanical).
16. Replace Storage Space and Staff Room (550 s.f.) due to bathroom increase.

N. Studio Rink – B-124

1. Paint interior walls – treatment for mold growth required by certified environmental remediation company (not in estimate).
2. Paint hollow metal doors and window frames.
3. Electrical - no upgrade in lighting required.
4. Fire Protection (included in Fire Protection).
5. Mechanical (included in Mechanical).
6. Refrigeration (included in Refrigeration).
7. Replace reflective ceiling.

O. Main Ice Rink – B-106

1. Paint interior CMU walls.
2. Provide ADA exit access at northeast and southeast corners of space. Remove existing steps, lower doors, provide exterior ramp, canopy and drain.
3. Structural items (see Structural Section).
4. Electrical – no upgrade required for lighting (included in Electrical Section).
5. Mechanical (included in Mechanical).
6. Fire Protection (included in Fire Protection).
7. Refrigeration (included in Refrigeration Section).
8. Replace bleacher seats with solid plastic bleachers, re-work aisles, and add handrails.
9. Remove bleacher seats and create 9'-0" wide level platform for accessible seating.
10. Provide one accessible hydraulic lift for bleacher seat area.
11. New skate tile rubber floor.
12. New H-M double door and frame to replace door #83.
13. Replace reflective ceiling.
14. Grout cracks in concrete floor.
15. Replace exterior overhead door.
16. Replace existing dasher board shields with tempered glass on north side of rink

P. Mechanical Room – Room B-104

1. All work is included in MEP, Fire Protection, and Refrigeration
2. Structural work (see Structural Section)

Q. Warming Room – B-101

1. All work is included in MEP, Fire Protection, and Refrigeration
2. Structural work (see Structural Section)

R. Surfacer Room – B-105

1. Seal cracks in concrete slab.
2. Treatment for mold growth required by qualified environmental remediation company (not in estimate).
3. All other work is included in MEP, Fire Protection, and Refrigeration
4. Structural work (see Structural Section)
5. Selective concrete slab replacement.

Robert Crown Community Center Renovation Recommendations
Preliminary Estimate of Probable Construction Cost: Civil/Site/Architectural

Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
A	**Site Work (Building Entry)**				
A-1	Detention Pond	3550 cy	$ 20	$ 71,000	
	Replace Curb	20 lf	15	300	
A-2	12" Underground Drain Pipe	260 lf	45	11,700	
	Catch Basins	2 ea	1500	3000	
	Control Structure Connect to Tunnel Shaft	1 ls	Allowance	45,000	
A-3	Curb Ramp with Detectable Warning	2 ea	1500	3000	
A-4	New Lighting			By Other	
A-5	Replace Concrete Slab (13'x20')	260 sf	15	3900	
A-6	Replace Handicap Ramp with New Concrete ADA Compliant Ramp 30'x6'	180 sf	40	7200	
A-7	Re-grade North Side of Building 225'x4'	900 sf	5	4500	
A-8	New Gravel Strip	75 tons		5000	
	Subtotal				$154,600
B	**Building Façade Renovation**				
B-1	Power Wash Exterior Walls Power Washing	28,926 sf	1	28,926	
B-2	Paint Exterior Metal Doors	28 ea	100	2800	
B-3	Paint Exposed Steel Fascia and Deck Paint Steel Paint Facia 61' x 4'	1 ls 244 sf	3000 1	3000 244	
B-4	Tuck-point Masonry Tuck-pointing	835 sf	3	2505	
B-5	Paint Steel Pipe Painting	120 lf	10	1200	
B-6	Concrete Slab 16'x13'	208 s.f.	15	3120	
B-7	Reseal Control Joints	1 ls	5000	5000	
B-8	Install New Handrail	1 ls	1500	1500	
	Subtotal				$49,295

Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
C	**Classroom Renovations**				
	Multipurpose Room A/B (A103)				
C-1	Remodel Entry Door ADA Build Pocket for Movable Partition	3 ea 1 ls	450 1000	1350 1000	
C-2	New Acoustical Tile Including Demolition	1765 sf	3	5295	
C-3	Paint Doors/Frames	3 ea	100	300	
C-4	Paint Interior Masonry	1680 sf	0.65	1092	
C-5	Replace Cracked Floor	177 sf	5	885	
C-6	Replace Lighting Option: Increasing Lighting Level			By Others By Others	
C-7	Mechanical Ductwork			By Others	
C-7a	Fire Protection			By Others	
	Subtotal				$9922
	Craft Room (A-106)				
C-8	Paint Interior Walls	1640 sf	0.65	1066	
C-9	Paint Ceiling Structure	1690 sf	1	1690	
C-10	Repair/Replace Skylight			By Others	
C-11	Provide Flue to Roof "A" Label Door	1 ea	1000	1000	
C-12	Paint Doors/Frames	3 ea	100	300	
C-13	Replace 35 linear feet of Base Cabinets and Countertop	35 lf	250	8750	
C-14	Lighting			By Others	
C-15	Electrical			By Others	
C-16	Mechanical			By Others	
C-17	Fire Protection			By Others	
	Subtotal				$12,806
	Game Room (A-119)				
C-18	Paint Interior Walls	1320 sf	0.65	858	
C-19	Paint Doors	3 ea	100	300	
C-20	New Acoustical Tile	955 sf	3	2865	
C-21	Replace Closet Doors with Lockable	2 ea	800	1600	
C-22	Light Fixture			By Others	
C-23	Rework Mechanical			By Others	
C-24	Fire Protection			By Others	
	Subtotal				$5623

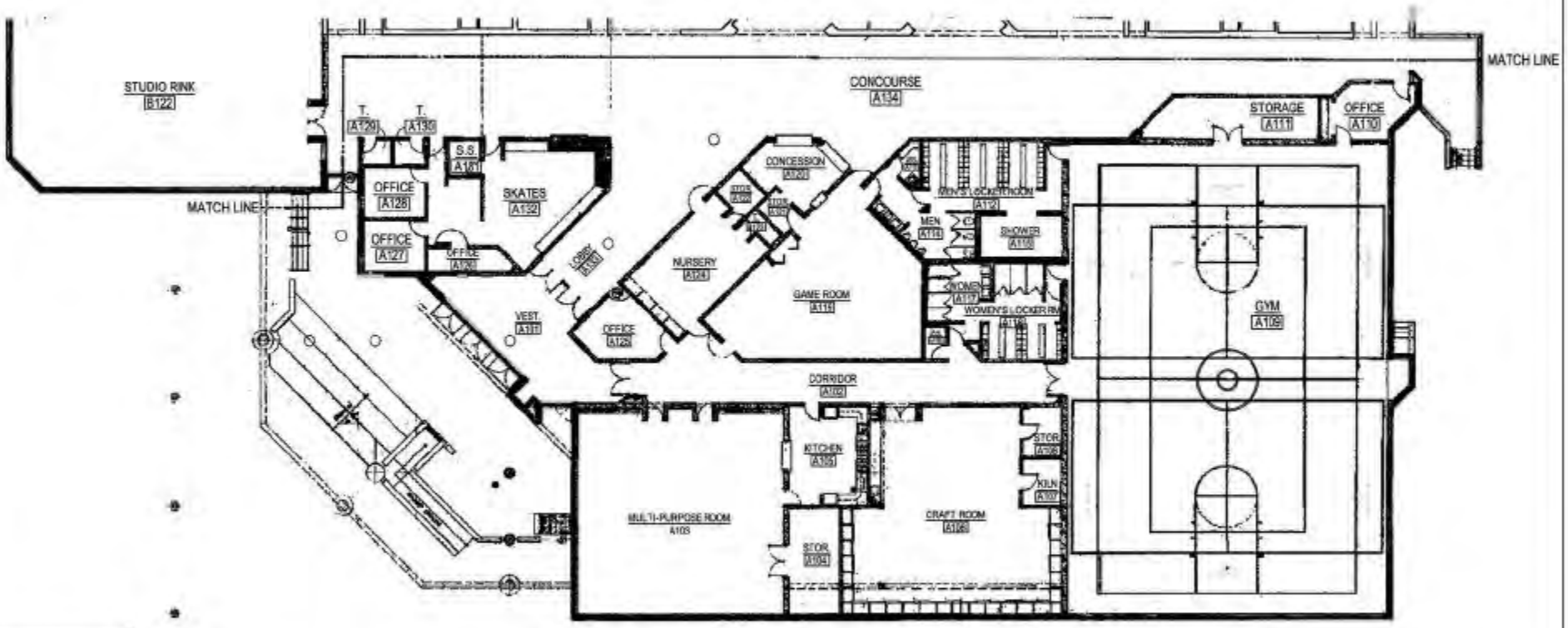
Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
	Nursery (A-124)				
C-25	Paint Interior Walls	860 sf	0.65	559	
C-26	Paint Doors	3 ea	100	300	
C-27	Acoustical Tile	440 sf	3	1320	
C-28	Light Fixtures			By Others	
C-29	Mechanical			By Others	
C-30	Fire Protection			By Others	
C-31	New Floor	440 s.f.	5	2200	
	Subtotal				$4379
D	**Kitchen (A-105)**				
D-1	Replace Cabinetry	47 lf	350	16,450	
D-2	Additional Sink			By Others	
D-3	New Washable Mylar Ceiling (Demolish Plaster Ceiling)	320 sf	5	1600	
D-4	Ceramic Tile Floor	320 sf	8.50	2720	
	Base	72 lf	8.50	612	
D-5	Paint Walls CMU	720 sf	0.65	468	
D-6	New Lighting			By Others	
D-7	Mechanical			By Others	
D-8	Fire Protection			By Others	
D-9	Pass-Thru	1 ls	3000	3000	
	Subtotal				$24,850
E	**Men's & Women's Locker Rooms (A-112-A-115) (A-116-A-118)**				
E-1	Demolition	1549 sf	3	4647	
E-2	Plumbing Fixtures			By Others	
	Solid Surface Counter Top	24 lf	125	3000	
	Plastic Lockers	60 ea	200	12,000	
	Benches	50 lf	100	5000	
E-3	Paint Walls & Doors				
	Walls	4820 sf	0.65	3133	
	Doors	5 ea	100	500	
E-4	Wet Walls Ceramic	250sf	8.50	2125	
	Base	30 sf	8.50	255	
E-5	New Ceiling	1549 sf	3	4647	
E-6-E-9	MEP			By Others	
E-10	Ceramic Floor	800 sf	8.50	6800	
	Base	432 lf	8.50	3672	

Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
E-11	New Toilet Accessories	2 ea	1000	2000	
E-12	New Skate Tile in Locker Area		See Rubber Skate Floor	See Rubber Skate Floor	
	Subtotal				$47,779
F	**Offices (A-125-A132 & A-110)**				
F-1	New Capret	225 sy	24	5400	
F-2	New ADA Hardware	9 ea	450	4050	
F-3	Paint Interior Walls SMU	4280 sf	0.65	2782	
F-4	New Acoustical Tile	2025 sf	3	6075	
F-5	Modify 2 doors – ADA	2 ea	500	1000	
F-6	Modify Counter Height – ADA	1 ea	1500	1500	
F-7	Remodel Employee Baths – ADA	1 ls	5000	5000	
F-8,9,10	MEP			By Others	
	Subtotal				$25,807
G	**Concession Stand (A-120-A-121)**				
G-1	Modify Counter Height – ADA	1 ls	1500	1500	
G-2	Replace Cabinetry	41 lf	350	14,350	
G-3	Paint Interior Walls	760 sf	0.65	494	
G-4	New Acoustical Tile	215 sf	3	645	
G-5	Lighting			By Others	
G-6	Quarry Tile	215 sf	14	3010	
G-7, 8	MEP			By Others	
G-9	Relocate Entry to Hallway	1 ls	4500	4500	
	Subtotal				$24,499
H	**Corridor (A-102)**				
H-1	Lay-in-ceiling	840 sf	3	2520	
H-2	Paint CMU Wall	2420 sf	0.65	1573	
H-3	Light Fixtures			By Others	
H-4	Paint Window Frames	8 ea	100	800	
H-5, 6	MEP			By Others	
	Subtotal				$4893
I	**Entry (Vestibule, Lobby, Concourse) (A-101, A-133, A-134)**				
I-1	Paint Interior Walls CMU	6160 sf	0.65	4004	

Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
I-2	Replace Metal Ceiling with Acoustical Tile	3678 sf	3	11,034	
I-3	Paint Doors / Window Frames				
	Doors	7 ea	100	700	
	Windows	6 ea	100	600	
I-4	Repair / Replace Skylight			Included in Roofing	
I-5	Replace Existing Skate Change Benches	Allowance	15,000	15,000	
I-6, 7, 8	MEP			By Others	
I-9	Hardware Vestibule Doors	11 ea	350	3850	
I-10	Accessible Lockers	30 ea	200	6000	
I-11	New Skate Tile Rubber Floor		See Rubber Skate Floor	See Rubber Skate Floor	
I-12	Replace Vestibule Doors	5	2000 ea	10,000	
I-13	Add 1 Door at Main Entry	1	4000 ea	4000	
	Subtotal				$55,188
J	**Gymnasium (A-109)**				
J-1	Paint Interior CMU Walls	8400 sf	0.65	5460	
J-2	Paint Exposed Structure / Metal Deck	5985 sf	1	5985	
J-3,4,5	MEP			By Others	
J-6	Paint HM Doors / Frames	6 ea	100	600	
J-7	Add 1 Exterior Door	1 ea	7500	7500	
J-8	Reverse Door Swings	1 pr	2500	2500	
J-9	Gym Floor Replacement	5888	10	58,880	
	Subtotal				$80,925
K	**Team Rooms (B-121, B-118, B-112, B-109)**				
K-1	Paint Interior Walls & Concrete				
	Ceiling	3520 sf	0.65	2288	
	Walls	1295 sf	0.75	972	
	Ceiling				
K-2	Replace Wood Benches	256 lf	50	12,800	
K-3	New skate tile floor (see "Rubber Skate Floor" category				
K-4,5	MEP / Fire Protection			By Others	
K-6	Remodel Entry – ADA	4 ea	600	2400	

Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
K-7	Door Hardware – ADA Compliant	4 ea	600	2400	
K-8	Remodel Toilet Area – ADA Standards	340 sf	85	28,900	
	Subtotal				$49,760
L – M	**Public Washrooms (B-117, B-116, B-115, B-113)**				
L/M-1-9	Remodel Area and Convert to Washrooms	730 sf	200	146,000	
L/M-10-15	MEP			By Others	
L/M-16	Replace Staff & Storage Room	550 sf	100	55,000	
	Subtotal				$201,000
N	**Studio Rink (B-124)**				
N-1	Paint Interior Walls	5436 sf	0.65	3534	
N-2	Paint HM Doors/Frames	2 ea	100	200	
N-3,4,5,6	MEP Fire Protection			By Others	
N-7	Replace Reflective Ceiling	5737	10	57,370	
N-8	Replace Skate Tile Rubber Floor		See Rubber Skate Floor	See Rubber Skate Floor	
	Subtotal				$61,104
O	**Main Ice Rink (B-106)**				
O-1	Paint Interior CMU Walls	17,248 sf	0.65	11,212	
O-2	ADA Exit Access Northeast, Southwest Corner - Demolish, Provide New Ramp	2 ea	15,000	30,000	
O-3	Structural Issues			See Structural	
O-4,5,6,7	MEP			By Others	
O-8	Re-work Aisles and Handrails Remove Bleachers Replace All Bleacher Seats	1 ls 4024 lf 4024 lf	25,000 4 25	25,000 16,096 100,600	
O-9	Platform for Accessible Seating	700 sf	30	21,000	
O-10	Handicap Hydraulic Lift	1 ea	10,000	10,000	
O-11	New Skate Tile Rubber Floor		See Rubber Skate Floor	See Rubber Skate Floor	
O-12	Replace PR of H-M Door & Frame	1 ls	3,000	3,000	

Item	Scope	Quantity	Unit Price $	Cost $	Subtotal
O-13	Replace Reflective Ceiling	21,455 sf	10	214,550	
O-14	Repair Cracks in Concrete Floor	1 ls	10,000	10,000	
O-15	Replace Exterior Overhead Door	1 ls	10,000	10,000	
O-16	Replace Plastic Shields with Tempered Glass Allowance			25,000	
	Subtotal				$476,458
P	**Mechanical Room (B-104)**				
P-1	MEP			By Others	
P-2	Structural			See Structural	
Q	**Warming Room (B-101)**				
Q-1	MEP			By Others	
Q-2	Structural			See Structural	
R	**Surfacer Room (B-105)**				
R-1	Seal Cracks	770 sf	1.50	1155	
R-2	Mold Removal			N.I.C.	
R-3	MEP			By Others	
R-4	Structural			See Structural	
R-5	Selective Concrete Slab Replacement	100	25	2500	
	Subtotal				$3655
S	**Skate Tile Rubber Floor**				
	Includes lobby, concourse, team rooms, new washrooms, and main rink perimeter and studio rink.	14,191	12	170,296	$170,296
T	**ADA Hardware**	40	450	18,000	$18,000
U	**ADA Signage – Complete Facility**			12,000	$12,000
	Total for Architectural/Site/Civil				**$1,492,839**



SCALE: 0 5 10 25 NORTH

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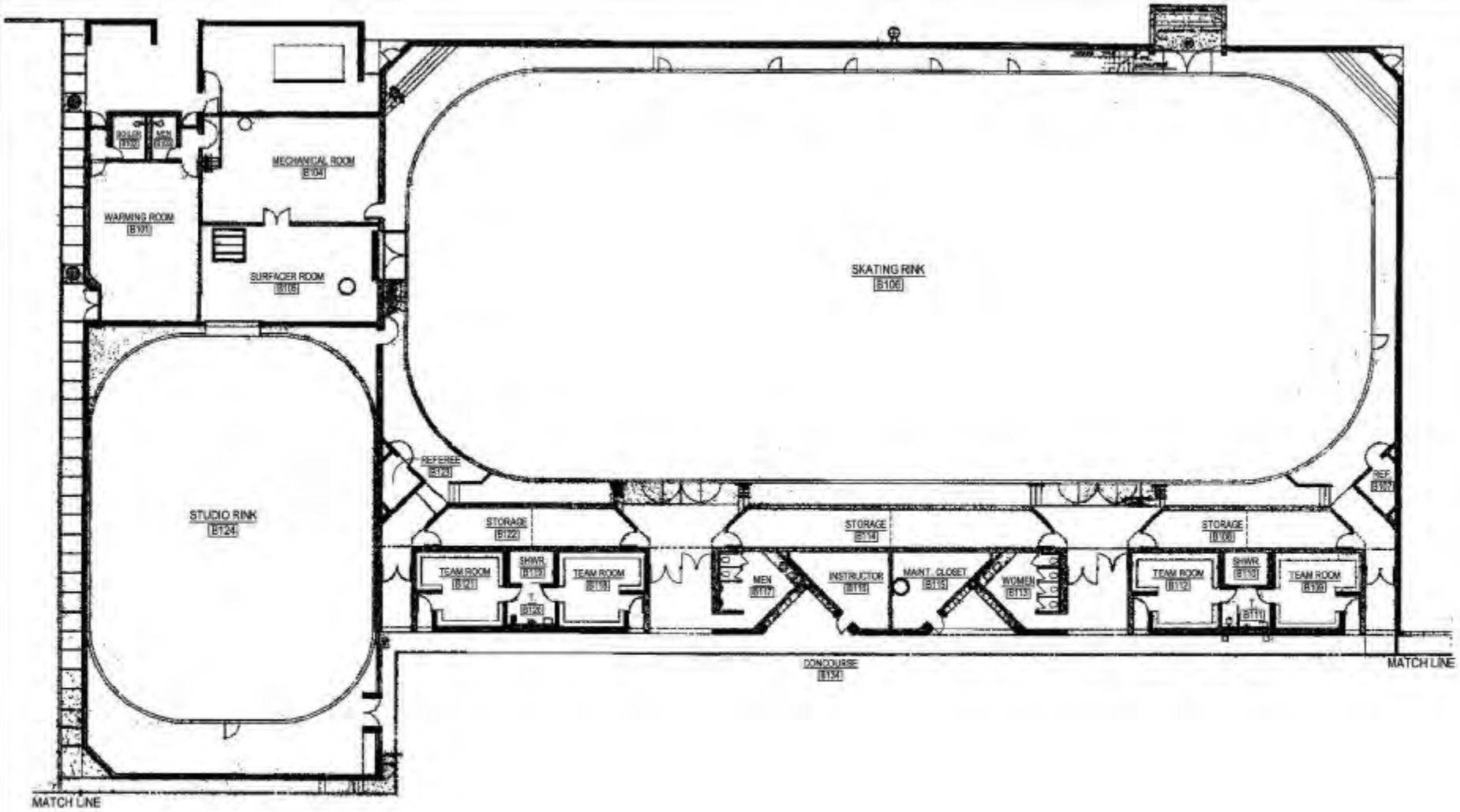
ROBERT CROWN CENTER
EVANSTON, IL

FLOOR PLAN
UNIT - A

PROJECT NUMBER:	DATE:
22288.01	01.01.03
SKETCH NUMBER:	DRAWN BY:
ASK-1	JGB



SCALE: 0 5 10 25

NORTH

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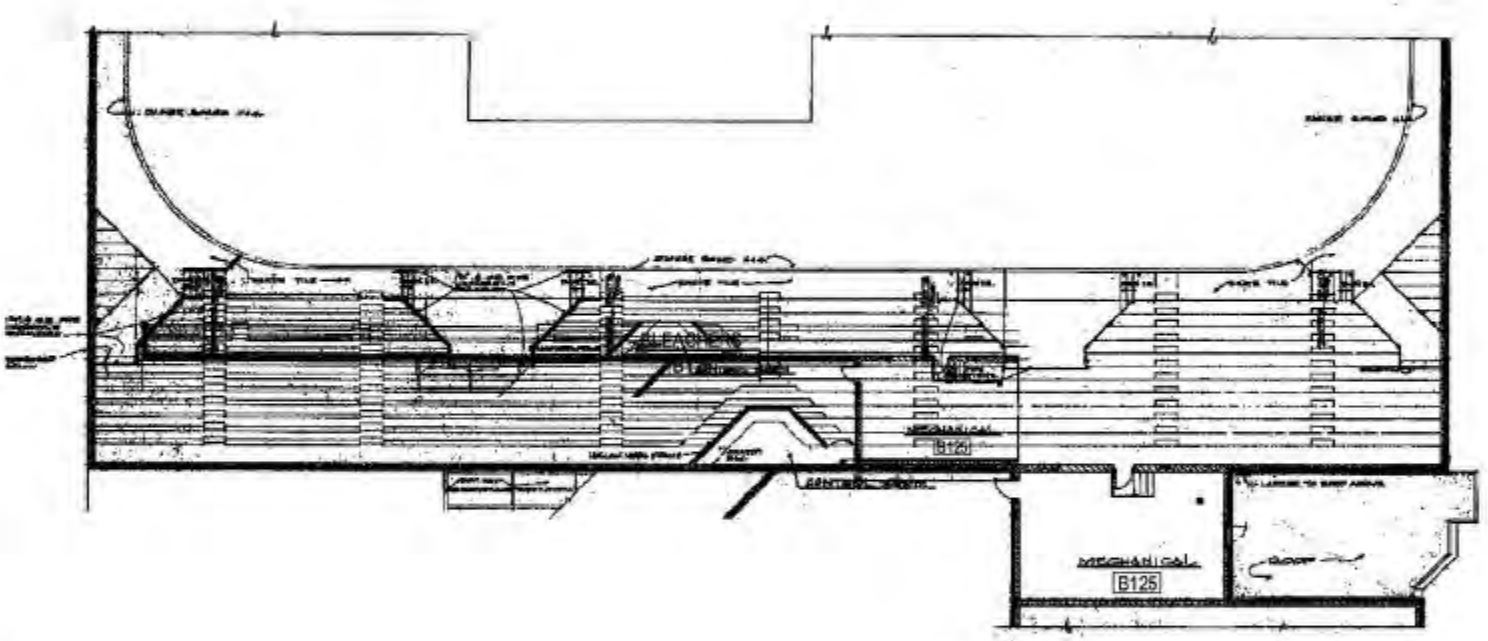
ROBERT CROWN CENTER
EVANSTON, IL

FLOOR PLAN
UNIT - B

PROJECT NUMBER:	DATE:
22288.01	01.01.03
SKETCH NUMBER:	DRAWN BY:
ASK-2	JGB



SCALE: 0 5' 10' 25' NORTH

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ROBERT CROWN CENTER
EVANSTON, IL

UPPER LEVEL
FLOOR PLAN
UNIT - B

PROJECT NUMBER:	DATE:
22288.01	01.01.03
SKETCH NUMBER:	DRAWN BY:
ASK-3	JGB

Section 3

Phase II – Civil Recommendations

Phase II – Civil Recommendations

The most cost effective solution to the drainage problems that exist at the Robert Crown Center is to provide a detention basin designed to store the 100 year storm event. This solution is cost effective because a relatively modest earthwork operation is low cost and a new detention basin does not require alterations of existing pavements or sewers. The detention basin is proposed as a means of reducing the potential for storm water run-off entering the building. Even with the detention basin, the parking lots will be inundated. The lots are intended to act as part of the means by which the run-off is conveyed away from the building.

The City of Evanston requires detention in general conformance with MWRD practices. The City of Evanston requires detention for the 100 year event, with an allowable release rate of 0.15 cfs per acre and rainfall intensities per IDOT Bulletin 70.

As has been observed and commented on previously, the Robert Crown Center is the low point within the surrounding park. The entire park, approximately 16.5 acres, can therefore drain toward the Robert Crown Center. The topography of the park is generally quite flat with a notable rise to the east, east of the Robert Crown Center. As the park is generally so flat, the entire park may not actually drain toward the Robert Crown Center, but could, in theory do so.

Because the surrounding area is park, the detention volume required for the entire park is not excessive. The only impervious area involved is the Robert Crown Center itself. We have calculated that approximately 2.2 acre feet of storage volume would be required. The earth excavated for the detention basin could be used to divert runoff from the east around the building, providing further protection from the rise in grade on the east side of the property.

The most logical place for the detention basin is immediately to the west of the parking area on the west side of the building. The basin needs to be lower than the parking areas to allow the parking areas to overflow into the basin when the capacity of the sewers for the parking areas is exceeded. The side slopes for the basin need to be no steeper the 4:1 and desirably flatter, where possible, to address pedestrian needs. The depth of the basin needs to be kept shallow, also in response to pedestrian needs. No trees would have to be moved or removed to accommodate a detention basin. Also, the proposed location of the basin does not affect the ball fields.

The major problem involved in providing any detention basin is the elevation of the existing parking areas and the elevation of the existing sewers in Main Street, to which the sewers would desirably connect. The

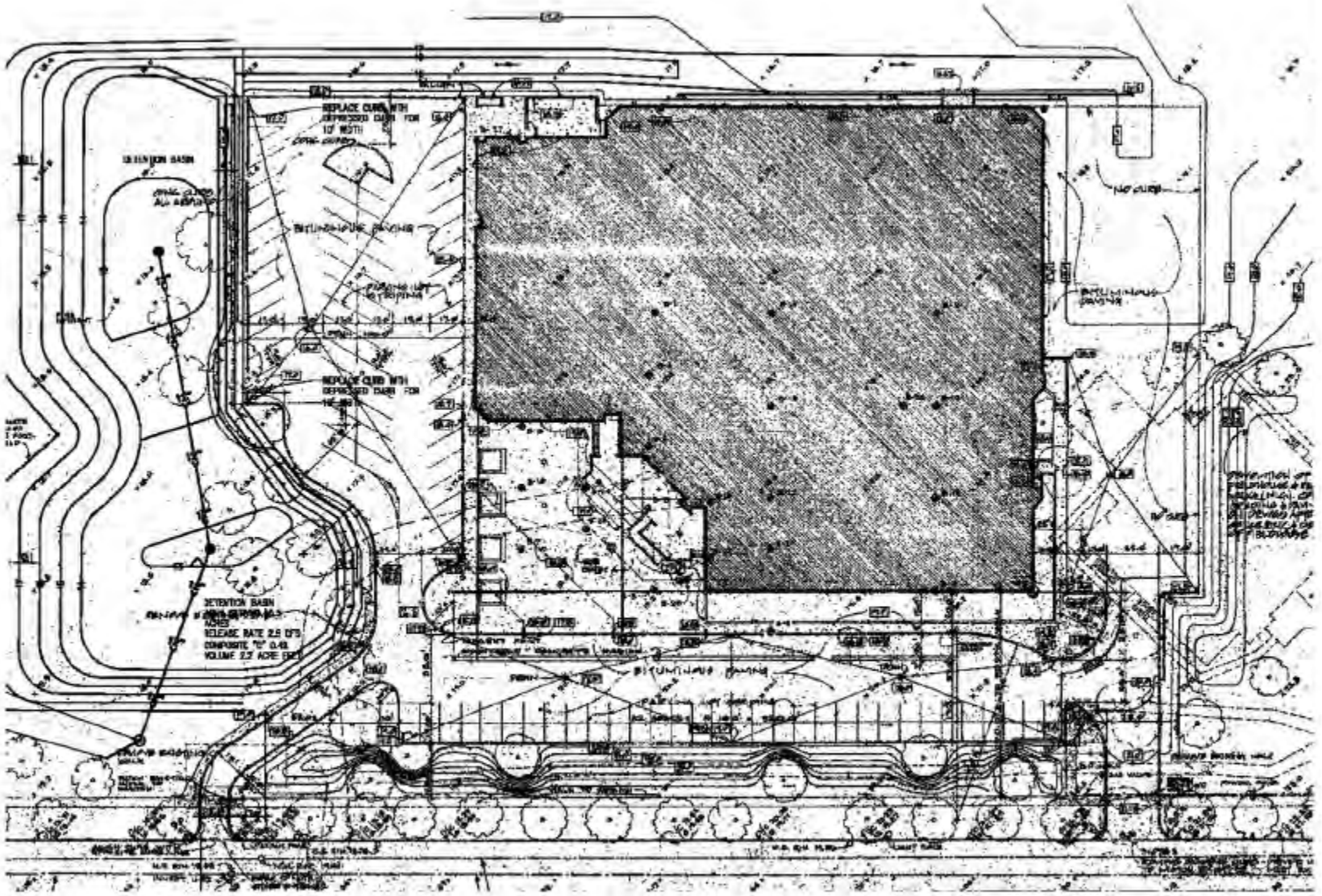
low points in the existing parking areas are as low as +16. The invert of the sewer in Main Street is approximately 11.5. As the detention basin needs to be below the parking areas, the vertical envelope in which the sewers can be made to work is very shallow. Desirably the sewers should have a minimum of 3 feet of cover above them. Theoretically, the bottom of the detention basin can be no lower than approximately +16. Providing the required volume, while not going any lower than +16, is virtually impossible, without adversely affecting the surrounding park and associated playfields.

There is another solution to this problem. There is a very deep sewer or tunnel in the area. If the City of Evanston would allow a connection to this sewer, the outfall is not a controlling factor. The only other option is to pump the release rate for the detention basin. A 2.5 cfs, approximately 1100 gpm pump station is not inexpensive and represents a lifetime maintenance and operational cost issue. The deep sewer is approximately 50 feet deep. We have conferred on this issue with the City of Evanston. The City has indicated that the possibility of the connection to the deep sewer is a potential solution that the City would entertain.

There is no easy solution to the drainage issue here. The situation is unfortunate. The detention solution would appear to be the most cost effective, particularly if the City of Evanston would permit a connection to the deep sewer. We also must note that a detention basin solution will provide protection for the 100 year event. Rainfall events that exceed this event could still potentially be problematic.

See sketch CKS-1 for detention schematic.

Civil Subtotal (see Architectural)



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ROBERT CROWN CENTER
EVANSTON, IL

SITE PLAN

PROJECT NUMBER:	DATE:
22288.01	01.01.03
SKETCH NUMBER:	DRAWN BY:
CSK-1	JGB

Section 4

Phase II – Structural Recommendations

Phase II – Structural Recommendations

1. *Main Ice Rink – Joist Bearing*
   There are two options to address the existing condition.
   The connection of the bottom chord of the joists to the masonry wall should be re-established and the anchor bolts that are loose should be re-grouted, or recommendation #6 should be implemented. This is an either/or situation. The minimal option is to reattach the bottom chord of the joists to the exterior wall. The recommended remedy is option #6 listed below, involving the installation of new wind columns.

2. *Main Ice Rink - Juncture of East Wall and Concrete Grandstand*
   A new tube column/brace should be installed as depicted on the following sketch (SSK-1 thru SSK-4). The tube will provide additional support for the grandstand, eliminating further differential settlement. The tube will also brace the adjacent masonry wall restricting further movement. The additional post is intended to restrict further differential settlement by establishing a link between the exterior wall, the concrete grandstand and the slab-on-grade.

3. *Studio Ice Rink – Masonry Walls*
   Vertical cracking is not detrimental to the structural capacity of the wall. No structural modifications are required.

4. *Warming Room #B-101 – Masonry Walls*
   A series of new angles should be installed to re-establish a connection between the separated masonry walls as depicted on the following sketch (SSK-5). The reinforcement indicated on the sketches will reestablish lateral stability to the wall.

5. *Drifting Snow Loads*
   A series of new angles could be installed to reinforce the existing web members of joists where their shear capacity is exceeded when compared to the current snow drifting criteria as depicted on the following sketch (SSK-6)

   At this time, there is no requirement by the City of Evanston to upgrade existing structural elements to comply with current code requirements. Therefore, the suggested modifications are recommended but not required.

6. *Wall Wind Loads*
   The description of this option is in lieu of item #1 above. It addresses the increase in the structural integrity of the wall to resist wind loads. This recommendation involves the installation of 48 steel wide-flange columns, anchored at the base to help the masonry wall resist wind loads. This solution will also dampen the forces which created a crack in the main rink south wall at the westernmost joist.

At this time there is no requirement by the City of Evanston to upgrade existing structural elements to comply with current wind load code requirements. Therefore, the suggested modifications as depicted on the following sketches (SSK-7 thru SSK-9) are recommended but not required.

7. *Skylight*
   It was discovered that the existing skylight assembly was not positively attached to the support structure. The skylight assembly should be screwed, bolted or welded to the existing structural framing at 2'-0" o.c. around its perimeter. This recommendation is only valid if the skylight is not replaced, but repaired instead. It is still our recommendation to replace the skylight.

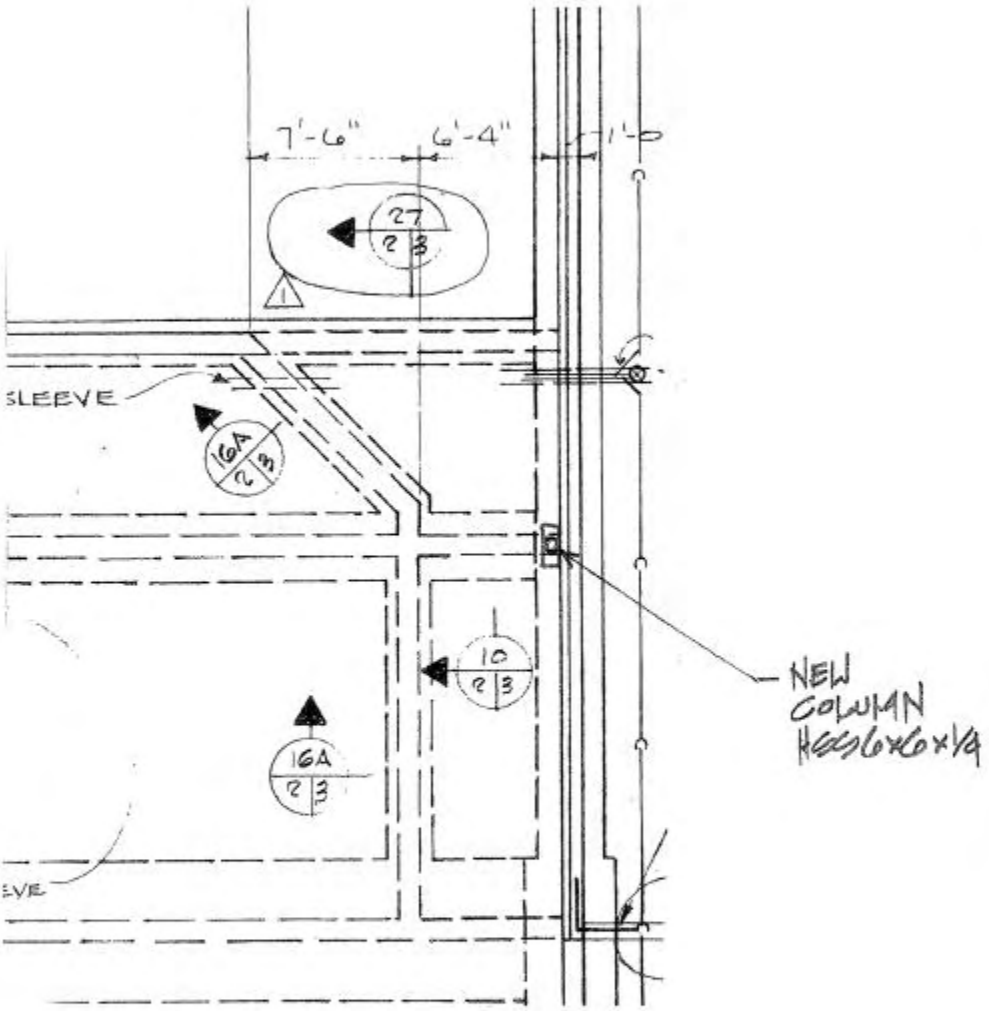
8. *Deck Attachment*
   It was discovered that the existing roof deck attachment to the supporting structure did not comply with current code requirements. At this time there is no requirement by the City of Evanston to upgrade existing structural elements to comply with current code requirements. It is therefore recommended, but not required, to provide additional roof deck welding (5/8" diameter puddle welds, 36/7 pattern) around the perimeter of the building (outer most 16 feet).

Note: At the time of future replacement of roof, Item 8, above, should be implemented. Cost estimate for Item 8: $9,700; not included in Grand Total Summary Sheet for Immediate Needs Category. This item is included in Ten Year Needs Category on the Grand Total Summary Sheet.

Phase II - Preliminary Estimate of Probable Construction Cost: Structural Work

Item	Scope of Work	Quantity	Unit Price $	Cost $
	Structural			
1	Reconnect Bottom Chord of Joists to Masonry Wall			See Item #6 Below
2	Grandstand Column Support (SSK-1 thru SSK-4)			2000
3	No Cost			
4	Warming Room B-101	18 ea	100	1800
5	Snow Drifting Joist Reinforcement (SSK-6)	36 ea	1000	36,000
6	Wind Load Column (SSK-7 thru SSK-9)			40,986
7	No Cost (in roofing cost)			
8	Deck Attachment			*
	Structural Subtotal			**80,786**

***** Deck attachment is $9,700 and should be performed at the time of entire roof replacement. The cost for this is not included in the Structural Subtotal.



PARTIAL FOUNDATION PLAN

EPSTEIN A.Epstein and Sons International, Inc. architects • engineers • planners 600 W FULTON STREET 312/454-9100 CHICAGO, IL 60661-1199 TELEX 25-4314				PROJECT: ROBERT CROWN SUBJECT: EAST WALL & GRANDSTAND	
DRAWN TAB	REVIEWED	DATE 12-18-02	PROJECT NO. 2288	REFERENCE DWG.	SKETCH SSK-1

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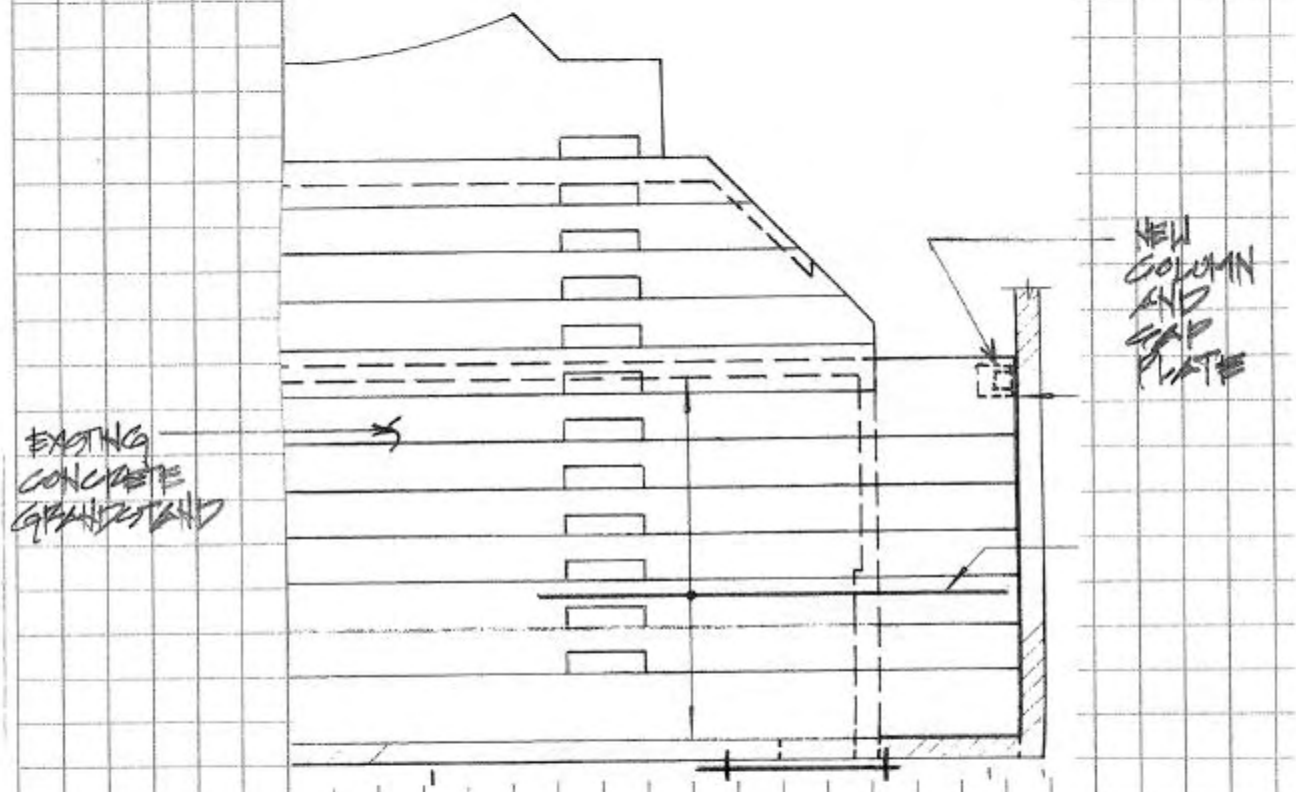

PARTIAL GRANDSTAND PLAN

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CHICAGO, IL 60661-1199
TELEX 25-4314

PROJECT: ROBERT CROWN	
SUBJECT: EAST WALL & GRANDSTAND	

DRAWN	REVIEWED	DATE	PROJECT NO.	REFERENCE DWG.	SKETCH
TAD		12-18-02	02288		SSK-2

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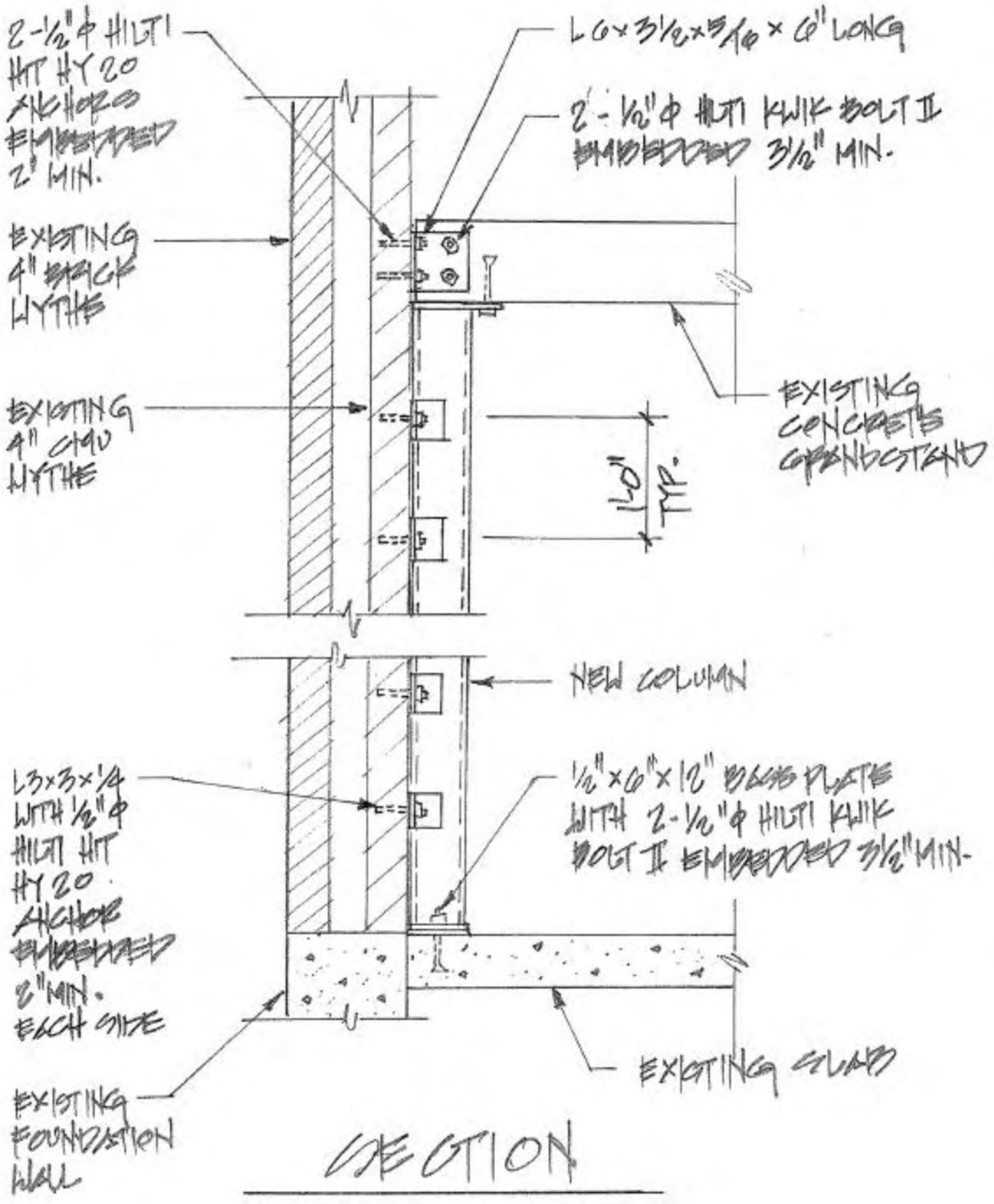

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				SUBJECT: EAST WALL & GRANDSTAND	
DRAWN TAB	REVIEWED	DATE 12-19-06	PROJECT NO. 2088	REFERENCE DWG.	SKETCH SK-3

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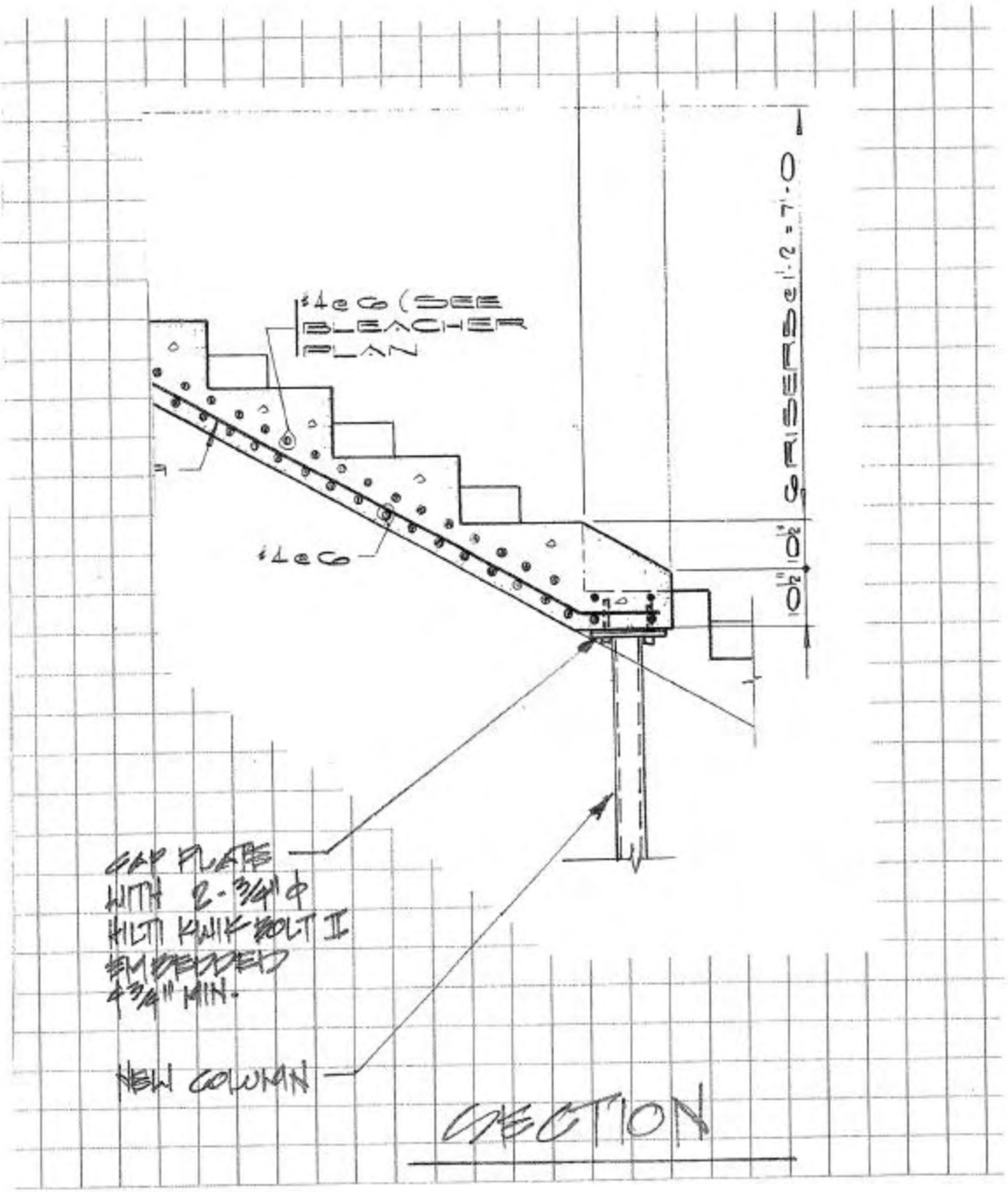

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DRAWN TAB	REVIEWED	DATE 12-18-02	PROJECT NO. 22288	REFERENCE DWG.	SKETCH SK-4

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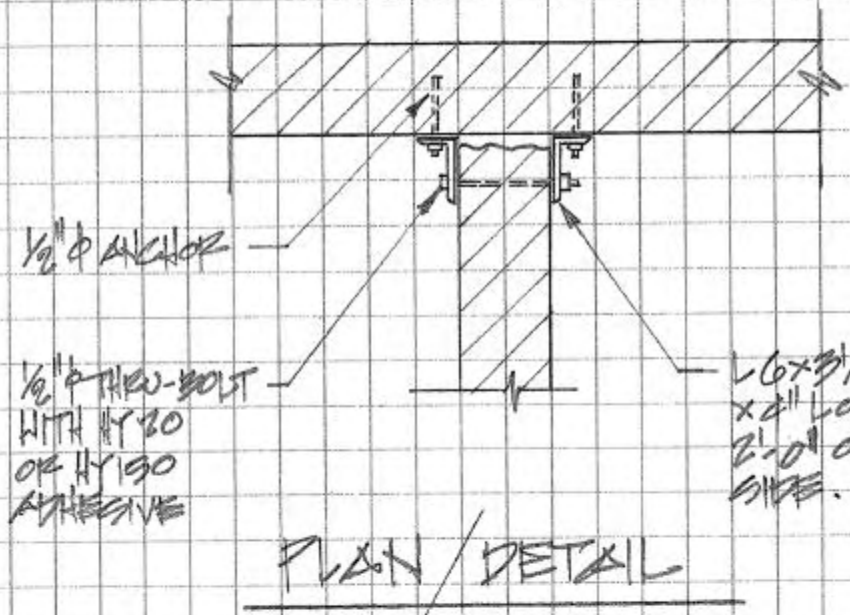
NOTE: PROVIDE HILTI HIT HY 20 ANCHORS WITH SLEEVES WHERE EXISTING MASONRY IS HOLLOW EMBEDDED 6" MIN.

OR

PROVIDE HILTI HIT HY 150 ANCHORS WHERE EXISTING MASONRY IS SOLID OR GROUTED SOLID EMBEDDED 4 1/4" MIN.



PLAN / DETAIL

EPSTEIN A. Epstein and Sons International, Inc. architects · engineers · planners 600 W FULTON STREET 312/454-9100 CHICAGO, IL 60661-1199 TELEX 25-4314				PROJECT: ROBERT CROWN SUBJECT: MECHANICAL ROOMS	
DRAWN TAB	REVIEWED	DATE 12-18-02	PROJECT NO. 2222	REFERENCE DWG.	SKETCH SSK-5

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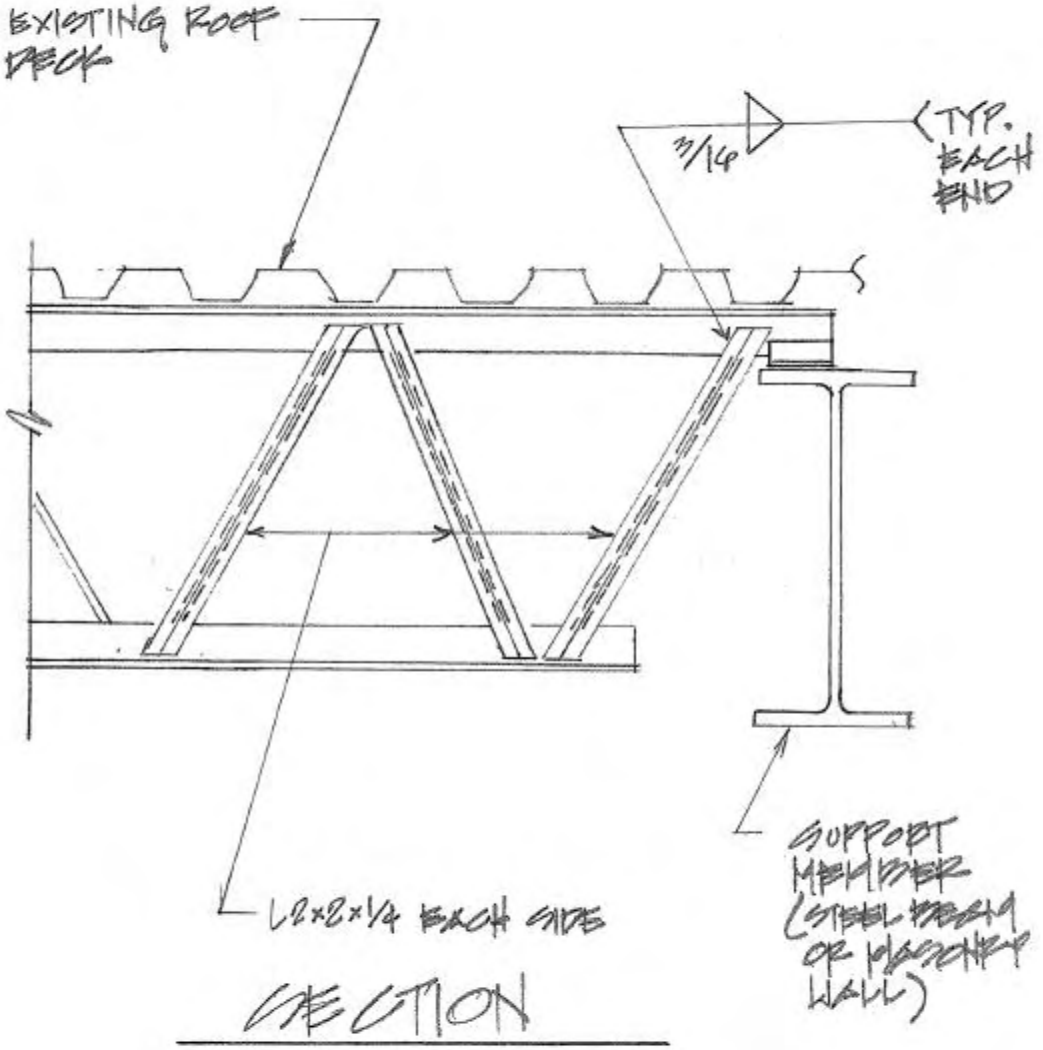
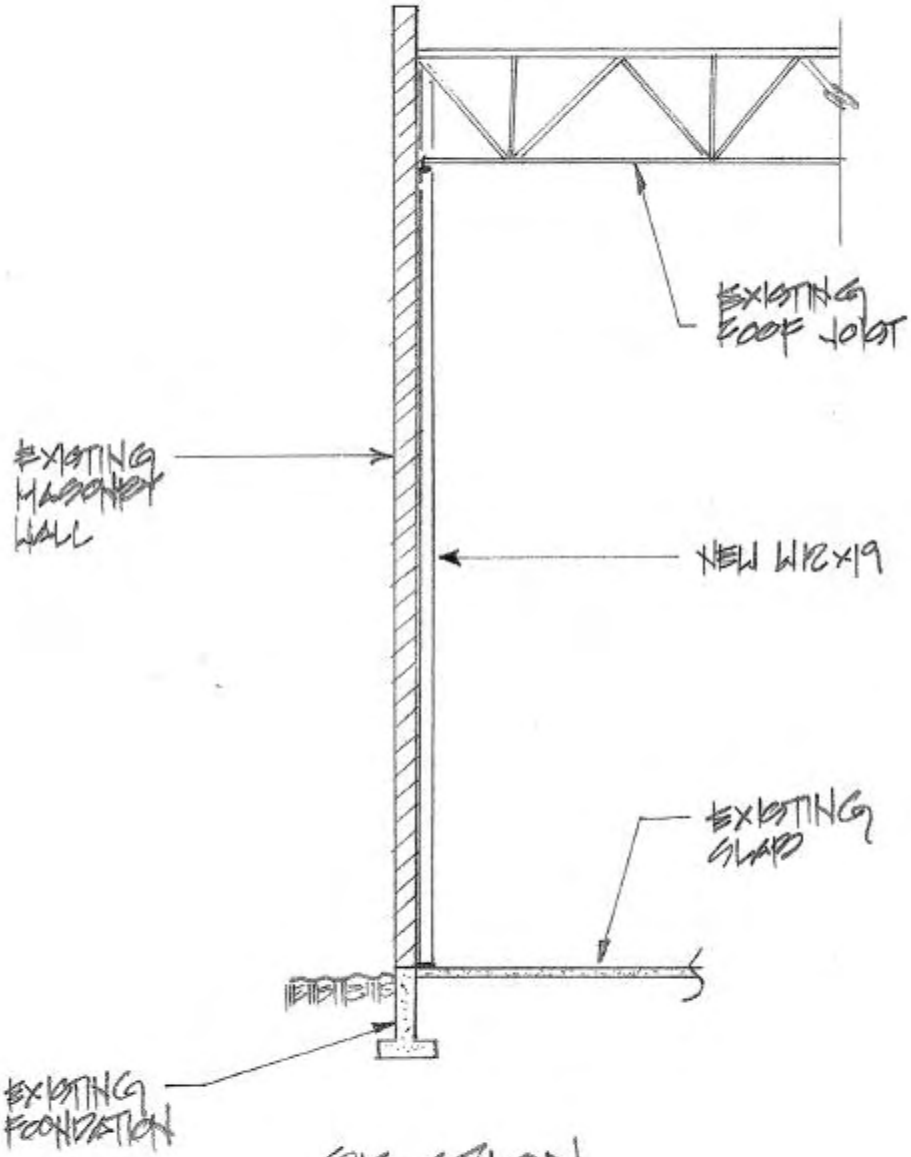
NOTE: PROVIDE JOIST WEB REINFORCEMENT FOR 3@ JOISTS.



SECTION

EPSTEIN A.Epstein and Sons International, Inc. architects · engineers · planners 600 W FULTON STREET 312/454-9100 CHICAGO, IL 60661-1199 TELEX 25-4314				PROJECT: ROBERT CROWN SUBJECT: DRIFTING SNOW LOADS	
DRAWN TAB	REVIEWED	DATE 12-18-02	PROJECT NO. 22000	REFERENCE DWG.	SKETCH SSK-6

NOTE: MASONRY WALL REINFORCEMENT AT 48 LOCATIONS.



SECTION

EPSTEIN
A.Epstein and Sons International, Inc.
architects · engineers · planners
600 W FULTON STREET
312/454-9100
CHICAGO, IL 60661-1199
TELEX 25-4314

PROJECT: ROBERT CROWN	
SUBJECT: WALL WIND LOADS	
REFERENCE DWG.	SKETCH SSK-7

DRAWN	REVIEWED	DATE	PROJECT NO.
TAD		12-18-02	22288

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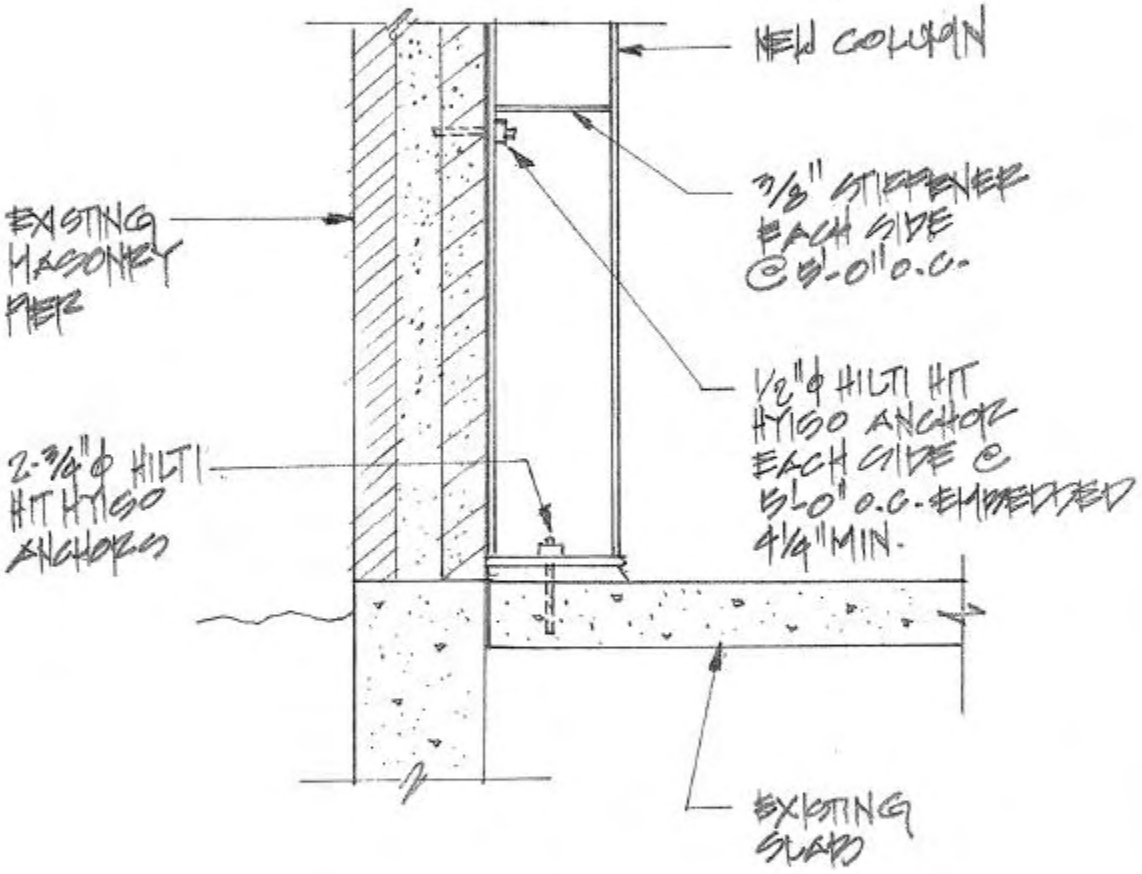
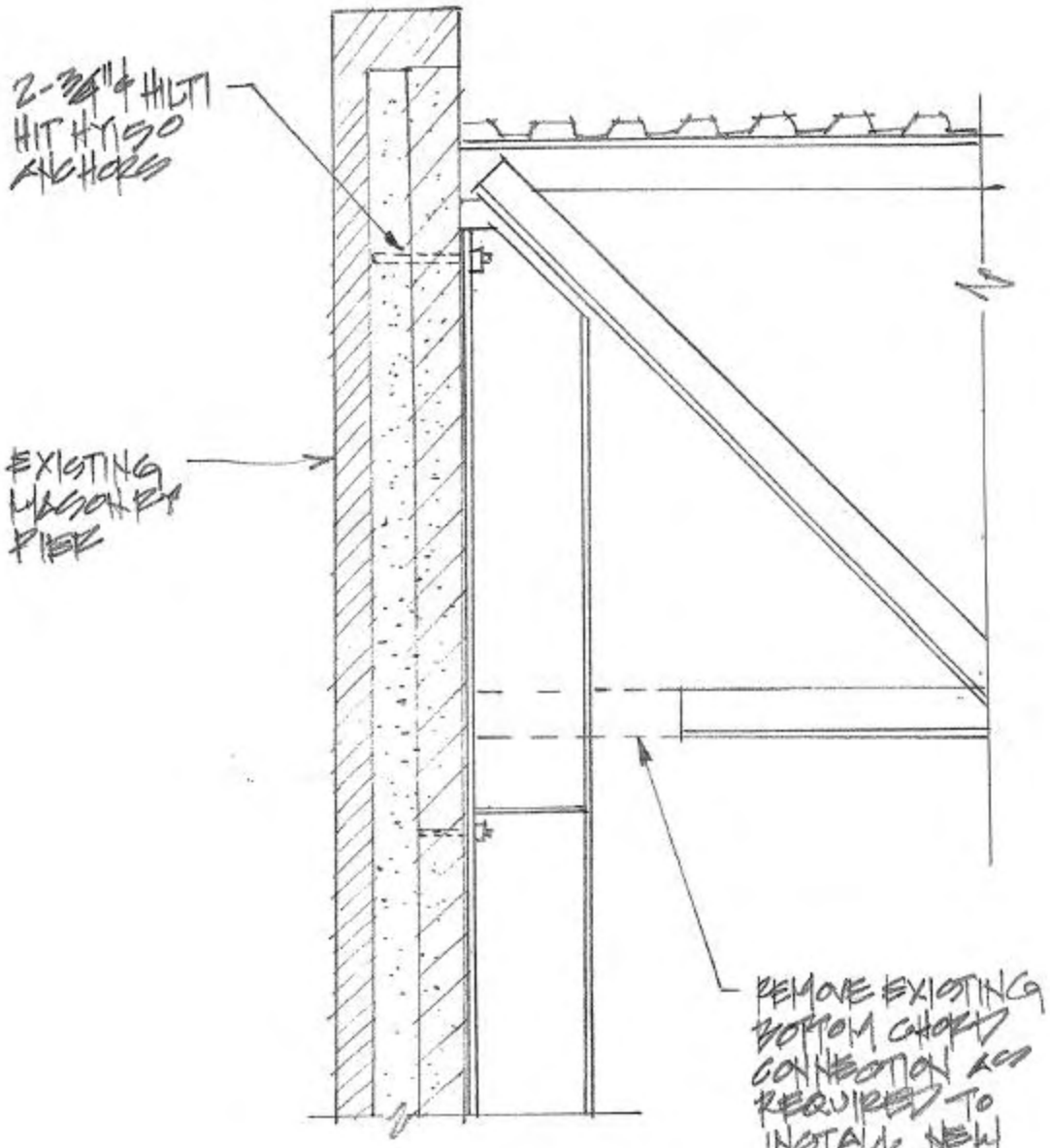


SECTION

EPSTEIN A.Epstein and Sons International, Inc. architects · engineers · planners 600 W FULTON STREET 312/454-9100 CHICAGO, IL 60661-1199 TELEX 25-4314				PROJECT: ROBERT CROWN SUBJECT: WALL WIND LOADS	
DRAWN TAB	REVIEWED	DATE 12-18-02	PROJECT NO. 22288	REFERENCE DWG.	SKETCH SSK-8



SECTION

EPSTEIN A.Epstein and Sons International, Inc. architects · engineers · planners 600 W FULTON STREET 312/454-9100 CHICAGO, IL 60661-1199 TELEX 25-4314				PROJECT: ROBERT CROWN SUBJECT: WALL WIND LOADS	
DRAWN TAD	REVIEWED	DATE 12-18-02	PROJECT NO. 22208	REFERENCE DWG.	SKETCH SSK - 9

Section 5

Phase II – Mechanical Recommendations

Phase II – Mechanical Recommendations

The air handling units for the Ice Rinks and Gymnasium are functioning but show signs of deterioration. Although maintenance work is evident, it is recommended that the units be replaced.

There are a number of exhaust fans that form part of the overall HVAC system. These fans remain operational but the large number of exhaust fans, roof penetrations, and required maintenance are reason for replacement. It is recommended that the exhaust fans be combined to minimize the number. The immediate Needs costs reflects the recommended combined system costs.

The HVAC systems, other than the Ice Rinks and Gymnasium, although operational, do not provide for recommended temperature control zones. The systems have been modified beyond the original design and incorporate equipment that does not provide for recommended ventilation rates for this facility. Heating coils, VAV boxes and controls are affected. The immediate needs costs provide for recommended ventilation rates as well as reconfiguration of mechanical systems related to locker and bathroom renovations. The costs reflect the recommended system replacement costs. As part of the equipment and system replacement, upgrading of the control and monitoring system is recommended. Replacement determination was based on equipment observation, normal life expectancy, design modifications over the years, and actual maintenance.

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
MECHANICAL									
Supply Fan SF-1	Unsatisfactory	1	26	25	1	29,000	B-124	--	7,420 cfm (2)
Supply Fan SF-2	Unsatisfactory	1	26	25	1	70,500	B-106	--	18,000cfm (2)
Supply Fan SF-3	Unsatisfactory	1	26	25	1	70,500	B-106	--	18,000 cfm (2)
Supply Fan SF-4	Unsatisfactory	1	26	25	1	45,000	B-125	--	25,670 cfm (2)
Supply Fan SF-5	Unsatisfactory	1	26	25	1	30,000	B-125	--	9,000 cfm (2)
Exh. Fan EF-1	Satisfactory	1	26	20	2	2,000	B-102	--	240 cfm Domex (2) (3)
Exh. Fan EF-2	Satisfactory	1	26	15	1	1,000	B-123	--	120 cfm Broan (2) (3)
Exh. Fan EF-3	Satisfactory	1	26	15	1	1,000	B-107	--	120 cfm Broan (2) (3)
Exh. Fan EF-4	Satisfactory	1	26	25	5	5,000	B-125	--	8,100 cfm In-Line (2) (3)
Exh. Fan EF-5	Satisfactory	1	26	25	5	10,000	B-125	--	20,000 cfm In-Line (2 (3)
Exh. Fan EF-6	Satisfactory	1	26	20	2	2,500	B-120	--	860 cfm Domex (2) (3)
Exh. Fan EF-7	Satisfactory	1	26	20	2	3,500	A-134	--	2,120 Domex (2) (3)
Exh. Fan EF-8	Satisfactory	1	26	20	2	1,000	B-130	--	120 cfm Domex (2) (3)
Exh. Fan EF-9	Satisfactory	1	26	20	2	2,500	A-114	--	1,900 cfm Domex (2) (3)
Exh. Fan EF-10	Satisfactory	1	26	15	1	1,000	A-121	--	60 cfm Broan (2) (3)
Exh. Fan EF-11	Satisfactory	1	26	20	2	1,500	A-105	--	400 cfm Domex (2) (3)
Exh. Fan EF-12	Satisfactory	1	26	20	2	2,500	B-105	--	1,450 cfm Domex (2) (3)
Exh. Fan EF-13	Satisfactory	1	26	20	2	1,500	A-120	--	295 cfm Domex (2) (3)
Exh. Fan EF-14	Satisfactory	1	26	15	5	1,000	A-107	--	120 cfm Broan (2) (3)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Room# / Location	Estimate of (1) Replacement / Cost 10 Yr. Needs	Comments
MECHANICAL									
Pump P-1	Satisfactory	1	26	20	2	6,000		--	Condenser pump 142 gpm (2)
Pump P-2	Satisfactory	1	26	20	2	6,000		--	Condenser pump 160 gpm (2)
Pump P-3	Satisfactory	1	26	20	2	6,000	B-104	--	Brine pump 605 gpm (2)
Htg Coil HC-1	Unsatisfactory	1	26	20	2	1,000	A-134	--	3 sq. ft. (3)
Htg Coil HC-2	Unsatisfactory	1	26	20	2	1,000	A-134	--	6 sq. ft. (3)
Htg Coil HC-3	Unsatisfactory	1	26	20	2	1,000	A-125	--	3.75 sq. ft. (3)
Htg Coil HC-4	Unsatisfactory	1	26	20	2	1,500	A-134	--	7.5 sq. ft. (3)
Htg Coil HC-5	Unsatisfactory	1	26	20	2	1,000	A-116	--	3.0 sq. ft. (3)
Htg Coil HC-6	Unsatisfactory	1	26	20	2	1,500	A-102	--	7.5 sq. ft. (3)
Htg Coil HC-7	Unsatisfactory	1	26	20	2	1,000	A-105	--	1.5 sq. ft. (3)
Htg Coil HC-8	Unsatisfactory	1	26	20	2	1,000	A-105	--	3.75 sq. ft. (3)
Htg Coil HC-9	Unsatisfactory	1	26	20	2	1,000	A-120	--	1.0 sq. ft. (3)
Htg Coil HC-10	Unsatisfactory	1	26	5	2	1,000	A-134	--	1.5 sq. ft. (3)
Htg Coil HC-11	Unsatisfactory	1	26	20	2	1,000	A-134	--	1.0 sq. ft. (3)
Htg Coil HC-12	Unsatisfactory	1	26	20	2	1,500	A-134	--	7.5 sq. ft. (3)
Htg Coil HC-13	Unsatisfactory	1	26	20	2	1,000	A-134	--	1.0 sq. ft. (3)
Htg Coil HC-14	Unsatisfactory	1	26	20	2	1,000	B-124	--	3.75 sq. ft. (3)
Htg Coil HC-15	Unsatisfactory	1	26	20	2	--	B-124	--	13.8 sq. ft. (4)
Htg Coil HC-16	Unsatisfactory	1	26	20	2	--	B-106	--	40.5 sq. ft. (4)
Htg Coil HC-17	Unsatisfactory	1	26	10	2	--	B-106	--	40.5 sq. ft. (4)

(1) Based on Current Costs (2) Included Electrical Hook-Up 3) See Recommendations (4) Included on Supply Fan
Categories – Satisfactory Unsatisfactory

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
MECHANICAL									
Unit Htrs UH-1	Satisfactory	1	26	13	1	1,500	B-105	--	Gas 12.5 MBH Input (2)
Unit Htrs UH-2	Satisfactory	1	26	13	1	1,500	B-104	--	Gas 20.0 MBH Input (2)
Unit Htrs UH-3	Satisfactory	1	26	13	1	1,500	B-101	--	Gas 31.0 MBH Input (2)
Air Cooled Condenser ACC-1	Satisfactory	1	3	20	17	--	Exterior B-125	--	Trane RA-750
Air Cooled Condenser ACC-2	Unsatisfactory	1	26	20	1	65,000	Exterior B-125	--	Trane RA-250 294,000 BTU (2)
Duct Furnace	Unsatisfactory	1	16	13	1	5,000		--	
Boiler	Satisfactory	1	24	15	1	15,000		--	
Boiler – HW	Satisfactory	1	3 Mo.	30	29	--		12,000	Weil McClain Gas-Fired Steam With Tanks (2)
Elect. Rad. Htrs.	Unsatisfactory	10	26	15	1			--	Delete due to ComEd rates

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
MECHANICAL								
Cooling Tower	Satisfactory	1	3	20	17	2,500/Sump Cleaning	--	10 year Maintenance
Ductwork	Satisfactory	--	26	30	4	40,000	20,000	Lump Sum (3)
Piping	Satisfactory	--	26	30	4	20,000	15,000	Lump Sum HVAC Systems Only (3)
Temperature Controls	Satisfactory	--	26	16	1	180,000	--	(3)
VAV Boxes	Unsatisfactory	16	16	20	1	60,000	--	(3)
Relief Vents	Satisfactory	4	26	30	4	6,000	--	

MECHANICAL SUBTOTAL - $712,500
(immediate needs)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 6

Phase II – Electrical Recommendations

Phase II – Electrical Recommendations

The primary electrical distribution equipment is in satisfactory condition and requires no upgrades to meet code. However, the general lighting throughout the facility, except for the Ice Rinks and Gymnasium, are below the recommended foot candle levels. A comparison chart is attached.

It is recommended that all lighting fixtures be replaced. The Current Replacement Cost Immediate Needs costs reflect the in-kind replacement of fixture types. The in-kind replacement cost will result in the same foot candle level as originally designed for the building.

To achieve the recommended foot candle levels listed in the attached chart, additional fixtures would be required. The estimated premium for this option is $38,000.

The electrical light fixtures require replacement due to the fact that the fluorescent lamps that were designed to be compatible with these fixtures are no longer manufactured. Their production has been prohibited by Federal Regulations related to environmental pollution. Currently manufactured lamps may be used in the existing fixtures but the ballast may need changing or the light may experience strobing effects. In any case, the lamp-life will be much shorter than its design life. We recommend changing out the fixtures to meet current electrical industry standards.

Robert Crown Illumination Levels

Area	Existing (fc)	Recommended (fc)
South Main Corridor* (A-133)		10-20
Under Fixture	7.5	
Center of Corridor	0.8	
Typical Point	2.9	
North Main Corridor* (A-134)		10-20
Under Fixture	6.9	
Typical Point	2.3	
East Corridor (A-102)		10-20
Center of Corridor	3-4.5	
Gymnasium (A-109)	30-50	30-50
Studio Rink* (B-122)		30-40
Center of Rink	12.1	
South End	12.5	
North End	14.3	
Under Fixture	55.3	
Main Rink (B-106)	12.1 12.5 14.3 55.3	10-50
Resurfacer Garage (B-105)	27	10-50
North Locker Room (B-112)	5.4-7.7	30
Men's Main Toilet Room (A-114)		25
Stall	6-8	
General	25	
At Lavatories	19	
Locker Room	25	
Women's Toilet Room (A-117)		25
Stall	13	
General	30	
Skate Storage Room	18.5	10-50
Kitchen (A-105)	42	75
Main Office (A-132)	17-49	75
Small Office (A-128)	46	75
Room C – Arts & Crafts (A-108)	54-64	60-80
Room A/B – Multipurpose Classroom (A-103)	28-30	50-75
Room 119	10-17	50-75

NOTE * Light levels are representative samples of typical program areas. Although lighting levels are important, of comparable importance is the uniformity of the lighting levels over the entire area. This should not vary by more than 1.5:1 to 2:1 for visual comfort. In the ice rink, the disparity between the light under the fixture and between fixtures is not detrimental due to the highly reflective surface of the ice and the ceiling. The ambient light level in these areas is adequate.

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL									
Electrical Main Switchboard	Satisfactory	1	26	50	24	--	B-104	--	
Double-Sided Distribution Panel	Satisfactory	1	26	50	24	--	B-104	--	
Distribution Panel 1	Satisfactory	1	26	50	24	--	B-104	--	
Power Panel 1	Satisfactory	1	26	50	24	--	B-104	--	
Power Panel 2	Satisfactory	1	26	40	24	--	B-125	--	
Emergency Panel	Satisfactory	1	26	40	14	--	B-104	--	
Lighting Panel A	Satisfactory	1	26	40	14	--	B-115	--	
Lighting Panel B	Satisfactory	1	26	40	14	--	B-127	--	
Lighting Panel C	Satisfactory	1	26	40	14	--	B-104	--	
Lighting Panel 1	Satisfactory	1	26	40	14	--	B-115	--	
Lighting Panel 2	Satisfactory	1	26	40	14	--	B-115	--	

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Room #/ Location	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL									
Lighting Panel 3	Satisfactory	1	26	40	14	--	A-118	--	
Lighting Panel 4	Satisfactory	1	26	40	14	--	A-121	--	
Lighting Panel 5	Satisfactory	1	26	40	14	--	B-104	--	
Lighting Panel 6	Satisfactory	1	26	40	14	--	A-106	--	
Lighting Panel 7	Satisfactory	1	26	40	14	--	B-127	--	
Canopy Lighting Panel	Satisfactory	1	26	40	14	--		--	
Transformer T-1	Satisfactory	1	26	40	34	--		--	

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL								
2x4 Fixture	Unsatisfactory	78	26	20	0	24,180	--	(3)
1x4 Fixture	Unsatisfactory	55	26	20	0	15,400	--	(3)
4x4 Fixture	Unsatisfactory	2	26	20	0	1,800	--	(3)
8 Strip Fixture	Unsatisfactory	107	26	20	0	26,750	--	(3)
Porc.Socket	Unsatisfactory	12	26	20	0	1,800	--	(3)
Downlight	Unsatisfactory	76	26	20	0	44,000	--	(3)
Shower Light	Unsatisfactory	71	26	20	0	17,500	--	(3)
4" Strip Fixture	Unsatisfactory	20	26	20	0	3,400	--	(3)
Metal Halide	Satisfactory	70	15	30	15		224,000	
2x2 Fixture	Unsatisfactory	1	26	20	0	310	--	
Exit Signs	Satisfactory	21	15	20	5	8,400	--	
Park. Lot	Unsatisfactory	4	26	20	0	22,000	--	30" Pole (3)
Park. Lot	Unsatisfactory	10	26	20	0	32,000	--	15' Pole (3)
2' Strip Fixture	Unsatisfactory	60	26	20	0	6,000	--	(3)
Pendant Fixture	Satisfactory	28	26	20	1	8,960	--	
Elec. Heater	Satisfactory	19	26	20	1	9,500	--	
Battery Units	Satisfactory	4	26	20	1	800	--	
Outlets	Satisfactory	Lot	26	20-30	1	35,000	--	
Switches	Satisfactory	Lot	26	20-30	1	35,000	--	
Ext. Light	Satisfactory	7	26	20	1	2,800	--	
Wiring	Satisfactory	Lot	26	40-50	14	--	--	
Plant. Outlets	Unsatisfactory	4	26	15	0	2,000	--	

() Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
ELECTRICAL								
Sound System								
Ice Rinks	Satisfactory	Lot	15	25	10	--	61,000	
Interior	Unsatisfactory	Lot	26	25	--	37,000	--	
Security	--	--	--	--	--	--	--	
Tele/Data	Satisfactory	Lot	--	--	--	--	35,000	
Pneumatic Switch	Unsatisfactory	1	26	20	0	5,000	--	

ELECTRIC SUBTOTAL - $335,100
(immediate needs)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 7

Phase II – Plumbing Recommendations

Phase II – Plumbing Recommendations

A basic facility assessment is to reflect "in kind" replacement costs for equipment and systems that require immediate replacement due to inadequate or faulty operation, and limit of life expectancy.

Another aspect of a facility assessment is to identify systems and equipment that do not meet the latest code requirements, i.e., ADA, Life Safety, etc. At this facility, the plumbing fixtures, although functional, do not meet the latest BOCA code. In addition to code requirements, there are dollars assigned to the replacement and/or maintenance of various plumbing items in the building. These include such items as joint replacement and leak repairs, cover bolt replacement on rod-out basins, cleaning of calcium build-up, and worn impeller replacement in the sump pumps.

It is recommended that the plumbing fixtures and local piping be replaced to meet the appropriate fixture count as well as meeting the ADA requirements. The Current Replacement Cost Immediate Needs reflect the fixture replacement cost, conforming with the latest code. Wall removal and replacement costs are included in the Architectural Scope of Work.

Toilet Fixtures By Illinois Plumbing Code

1. Recreational/Sports: 725 people (363 men; 363 women)

Women	Men
6 w.c.	3 w.c.
2 lavs	3 urinals *optional
	2 lavs

Drinking fountains for 725 people: 6 required

---

2. Classrooms/Education: 212 people (106 men; 106 women)

All Adult Use

Women	Men
6 w.c.	3 w.c.
3 lavs	3 urinals *optional
	3 lavs

Day Care/Pre-school Combination/Adults

Pre-school Use: The Craft Room (Room A-106) is licensed for 16 children. The Multipurpose Room (A-103) is licensed for 18 children. The Game Room is currently exempt but could be licensed for 30 children at 30 s.f./child for a total of 64 children.

Pre-school and Adult Use: 64 children; 59 adults
Day Care/Pre-School and Adult Use Combination:

Pre-school: 64 children (32 boys; 32 girls)

Female	Male
3 w.c.	3 w.c.
3 lavs	3 lavs

Adults: 59 adults (30 men; 30 women)

Female	Male
2 w.c.	1 w.c.
1 lav	1 urinal
	1 lav

Total for Adult/Pre-school Combination:

Female	Male
5 w.c.	4 w.c.
4 lavs	1 urinal
	4 lavs

Drinking fountain for 212 people: 3 required.

The more restrictive use is the Adult/Pre-school Occupancy Combination (total of 9 w.c.; 8 lavs & 1 urinal)

---

3. Mechanical: 17 people (unisex)

1 w.c.
1 urinal
1 lav

---

4. Offices: 21 people (11 men; 11 women)

Female	Male
1 w.c.	1 w.c.
1 lav	1 urinal *optional
	1 lav

Note: The above fixture count is a minimum required by code. The nature and functional layout of the existing facility actually requires slightly more fixtures due to the fact that toilet fixtures are associated with specific functional areas, i.e., public washrooms, locker rooms, offices, team rooms, and mechanical area. The actual number of suggested toilet fixtures can be found in the Architectural Recommendations Scope of Work and the Facility Assessment Survey Plumbing Fixture Chart.

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of [1] Current Replacement Cost Immediate Needs	Estimate of [1] Replacement/ Cost 10 Yr. Needs	Comments
PLUMBING								
Sanitary	Satisfactory	System	26	In excess of 50	24	4,000	2,000	Repairs
Sub-Soil	Unsatisfactory	System	26	In excess of 50	24	25,000	25,000	Possible blockage in S.E. corner of gym
Storm	Satisfactory	System	26	In excess of 50	24	4,500	5,000	Repairs
Rodout Basin	Satisfactory	7	26	In excess of 50	24	1,500	1,500	Repairs
Catch Basin	Satisfactory	1	5	In excess of 50	45	--	--	
Domestic C.W.	Satisfactory	System	26	In excess of 50	24	4,000	10,000	Repairs
Domestic H.W.	Satisfactory	System	26	25-30	4	4,000	10,000	Repairs
Sump Pumps	Satisfactory	4	10	20	10		5,000	
Water Closet	Satisfactory	48	26	In excess of 50	24	96,000	--	Flushing Devise (3) 25 Years
Urinal	Satisfactory	11	26	In excess of 50	24	22,000	--	Flushing Devise (3) 25 Years
Lavatory	Satisfactory	37	26	In excess of 50	24	74,000	--	Faucet 25 Years (3)
Drink. Fountain	Satisfactory	5	26	In excess of 50	24	10,000	----	Faucet 25 Years (3)

() Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
PLUMBING (cont'd)								
Dishwasher	Unsatisfactory	1	26	10	0	1,000	--	
Plaster Trap	Satisfactory	1	26	25	1	500	--	
Mop Basin	Satisfactory	3	5	In excess of 50	45	300	--	Faucet
Double Sink	Satisfactory	2	26	In excess of 50	24	300	300	Faucet
Sink	Satisfactory	1	26	In excess of 50	24	500	500	Faucet
Shower	Satisfactory	18	26	In excess of 50	24	18,000	--	(3)
Water Heater	Satisfactory	2	6 Mo.	10	9	2,500	20,000	
Recirc Pump	Satisfactory	1	20	10	1	3,000	--	
Floor Drain	Satisfactory	20	26	In excess of 50	24	--	20,000	
Roof Drain	Satisfactory	6	26	In excess of 50	24	--	4,500	
Hose Bibb	Satisfactory	4	26	50	24	--	2,000	

PLUMBING SUBTOTAL - $276,100
(immediate needs)

1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations (4) Included on Supply Fan

Section 8

Phase II – Fire Protection Recommendations

Phase II – Fire Protection Recommendations

There are areas of the facility that lack sprinkler system fire protection. This may have met the code at the time of design, but does not meet the latest code requirements adopted by the City of Evanston (1996 BOCA).

Although there are areas protected by a sprinkler system, it is recommended that a complete new wet sprinkler system be installed that protects all areas of this facility, including the Ice Rinks. Head placement and coverage areas within the existing system need adjustment, and it is recommended that, to assure proper function, piping and heads be new.

The complete system includes a fire pump to provide adequate pressure to the new system; a new piping system, (however some existing branch piping may remain), all new sprinkler heads; (replacement of existing standard response heads with quick response heads); and an approved fire alarm system. Ceiling removal and replacement are necessary. This is included in the Architectural Cost Estimate.

The current Replacement Cost Immediate Needs includes system piping, fire pump and fire alarm system costs including pull stations, strobes, alarms and annunciator panels for a complete fire alarm system. Additional fire extinguishers and cabinets have been added to comply with code requirements.

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
FIRE PROTECTION								
4" Check Valve	Satisfactory	1	26	50	24		--	(3)
4" Gate Valves	Satisfactory	2	26	50	24		--	(3) At Check Valve
Siamese	Satisfactory	1	26	In excess of 50	24+	--	4,000	(3)
Flow Switch	Satisfactory	1	26	25	1	2,000	--	(3)
Piping	Satisfactory	Syst	26	In excess of 50	24+	3,000	3,000	(3) Repairs
Alarm Bells	Satisfactory	2	26	25	1	2,000	--	
Sprinkler Heads	Satisfactory	Each	26	In excess of 50	24+	1,000	--	(3) Repairs

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

FACILITY ASSESSMENT

Component	Condition*	No. Of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Current Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Cost 10 Yr. Needs	Comments
FIRE PROTECTION								
Fire Ext. Cab	--	6	0		1	3,000	--	
Water Ext.	Satisfactory	1	26	10	1	500	--	
System Piping	--	Lot	0	50	24	140,000	--	Includes Demo (3)
Fire Pump	--	--	--	--	--	50,000	--	Includes Demo (3)
Fire Alarm	--	--	--	--	--	70,000	--	Includes Demo (3)

FIRE PROTECTION SUBTOTAL -$271,500
(immediate needs)

(1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan

Section 9

Phase II – Roofing Covering and Skylight Recommendations

Phase II – Roof Covering and Skylight Recommendations

Based on the roof investigation and analysis (as documented in the Phase I report), the following recommendations for the repair of the roof and skylights is outlined below. See drawing RSK-1 for roof area designation locations.

Prior to bidding the work described, bidding documents should be developed by a qualified designer.

Roof Coverings

1. *Roof A*: Remove the existing roof covering down to the steel deck and replace with the following: Two layers of 1.5" thick polyisocyanurate insulation (loose-laid), mechanically attached ¼" primed glass mat gypsum roof board ("Dens-Deck"), two-ply torched-applied white granule-surfaced SBS modified bitumen membrane (equal to Siplast P 20 EG TG and P 30 HT FR TG).

   Remove the existing unused mechanical equipment support curb.

   Provide tapered insulation between the new polyisocyanurate and glass at gypsum roof board to provide slope for positive drainage in the vicinity of the existing mechanical equipment support curbs.

   At the masonry walls, saw cut raggles and install new PVDF-painted counter-flashings.

   At the raised perimeter edge flashing, remove the existing edge flashing and install new PVDF-painted raised edge flashing.

   Remove the existing pitch pockets at the canopy support cables and install new pitch pockets and filler.

   Provide additional deck securement in isolated areas, as discussed in Structural Recommendations Section.

   Isolated portions of the steel deck may require removal and replacement because of corrosion. The need for replacement should be assessed by an architect or engineer after the roof covering is torn off.

2. *Roof C*: After the cracked mortar joints have been repaired, spot check the entire roof area with an electrical capacitance moisture meter. If potentially wet areas are detected, cut the membrane, remove wet materials and repair.

Remove the existing surface-mounted counter-flashing and saw cut a raggle and install a new PVDF-painted counter-flashing.

3. *Roof E*: Cut open and repair the large blister (described under "General Observations" in the "Roofing" section of the Phase I report).

4. *Roof F*: After the cracked mortar joints have been repaired, remove the surface-mounted counter-flashing and wet roofing materials along the southern end of the east wall. Repair the membrane. At the removed counter-flashing, saw cut a raggle and install new PVDF-painted counter-flashing.

   Seal the storm collar to the flue (see Photo R-13 in the Phase I report).

5. *Counter-flashings:* Existing counter-flashings are to remain (i.e., Roof D and the majority of Roof F), remove the existing sealant, clean the joint and install new sealant.

Note: As a more conservative approach, remove these counter-flashings, saw cut raggles and install new PVDF-painted counter-flashings. If the less expensive option of resealing is selected, when Roofs D and F are eventually re-roofed, saw cutting raggles and installation of new PVDF-painted counter-flashings are recommended.

6. *Copings*: A loose coping was observed during the pre-proposal site visit, and other loose copings were observed during the roof investigation. Because the copings are susceptible to disengagement from their anchorage clips, it is recommended that the inner leg (i.e., the leg adjacent to the roof) be face-fastened.

Note: Interim recommendations for implementation prior to installation of the new face-fasteners were emailed to Stefanie Levine on July 25, 2002.

7. *Ladder*: Install a wall-mounted ladder to provide easy access between Roof A and F.

8. *Inspections*: *(Spring and Fall)* In early spring and early fall, visually inspect all of the roof areas.[1] Remove debris (e.g., rocks, baseballs)

[1] For an inspection guide, see *Manual for Inspection and Maintenance of Built-Up and Modified Bitumen Roof Systems: A Guide For Building Owners* (available from the National Roofing Contractors Association [telephone: 800 323 9545]).

from the roof and roof drains, and check for roof damage. If damage is found, have it promptly repaired by a professional roofing contractor.

In addition to the above inspections, inspect all of the roofs in the spring and fall on a day when frost covers the roofs. Look for areas where frost does not occur (i.e., the surface of the membrane will be wet, rather than frosted). Mark the boundary of the wet/frosted area with a lumber crayon. Have core samples promptly taken at the wet area by a professional roofing contractor to determine if wet insulation occurs. If wet insulation is found, have the wet materials promptly removed and repaired by a professional roofing contractor.

Note: If wet insulation occurs, the stored heat energy in the wet insulation will typically be sufficient to inhibit frost formation. Lack of frost formation can also be caused by air from an exhaust fan.

9. *Snow shoveling*: If snow shoveling is performed, plastic shovels should be used. To avoid roof membrane damage, the snow should not be removed all of the way down to the membrane. During the following spring, the roof should be inspected by a qualified inspector to determine if the snow removal operations resulted in roof membrane damage. If the roof was damaged, wet materials should be removed and the roof promptly repaired. If the joist reinforcement recommendations are implemented, as outlined in the Structural Recommendations Section, then snow shoveling of roof should not be required.

Skylights

The glazing in the main skylight and the barrel vault skylight needs to be replaced. In addition, the gaskets in these skylights and the pyramidal skylights need to be replaced. It is technically feasible to replace the glazing and gaskets, rather than replace the entire skylight assemblies. However, if only the glazing and gaskets are replaced, meticulous care needs to taken in removing the existing sealant and cleaning the skylight frames prior to installation of the new gaskets and glazing. It is somewhat cheaper to replace the glazing and gaskets versus replacing the skylight assemblies. However, the risk of leakage is much greater with the cheaper solution because of the dependence on field labor to meticulously prepare the skylight frames for the new gaskets. Therefore, replacement of the skylight assemblies are recommended as follows:[2]

[2] After developing these recommendations, a skylight contractor was consulted. The skylight contractor concurred with the analysis and recommendations.

1. *Main skylight*: Remove the existing assembly and replace with a new assembly similar to the existing. However, in lieu of acrylic glazing, use glass (laminated glass for the bottom pane, tempered glass for the top pane). Use low-E glazing for improved energy conservation.

2. *Barrel skylight*: Remove the existing assembly and replace with a new assembly similar to the existing.

3. *Pyramidal skylights*: Remove the existing assemblies. Rebuild the curb at the unit that abuts the canopy cable pitch pocket, so that there is adequate clearance between the curb and the pitch pocket. Replace with new assemblies similar to the existing, except that in lieu of pyramidal skylights, install bubble skylights.

Note: Bubbles are less expensive than pyramids. However, if it is desired to retain the pyramidal appearance, replace with pyramidal units.

Phase II – Roof Covering and Skylight Recommendations – Cost Estimate

Note:

1. The following costs are based on the work occurring during the summer of 2003.

2. The costs do not include design fees for development of bidding documents or construction contract administration.

3. No allowance for semi-annual inspections – assume this will be performed by the City.

Costs

1. a. Remove and replace Roof A covering (13,160 square feet @ $12/sq ft): $157,920 Add downspouts, $3,000

   b. Cut new raggles and install new counter-flashings at Roof A (300 lineal feet @ $16/ft): $4,960

   c. Allow $5,000 for deck replacement.

2. Repair Roof C: $2,500

3. Repair Roof E: $500

4. Repair Roof F: $500

5. Reseal counter-flashings at Roof D and F (120 lineal feet @ $400/ft): $480.

   Note: In lieu of resealing, cut new raggles and install new counter-flashings (120 lineal feet @ $16/ft): $1,920

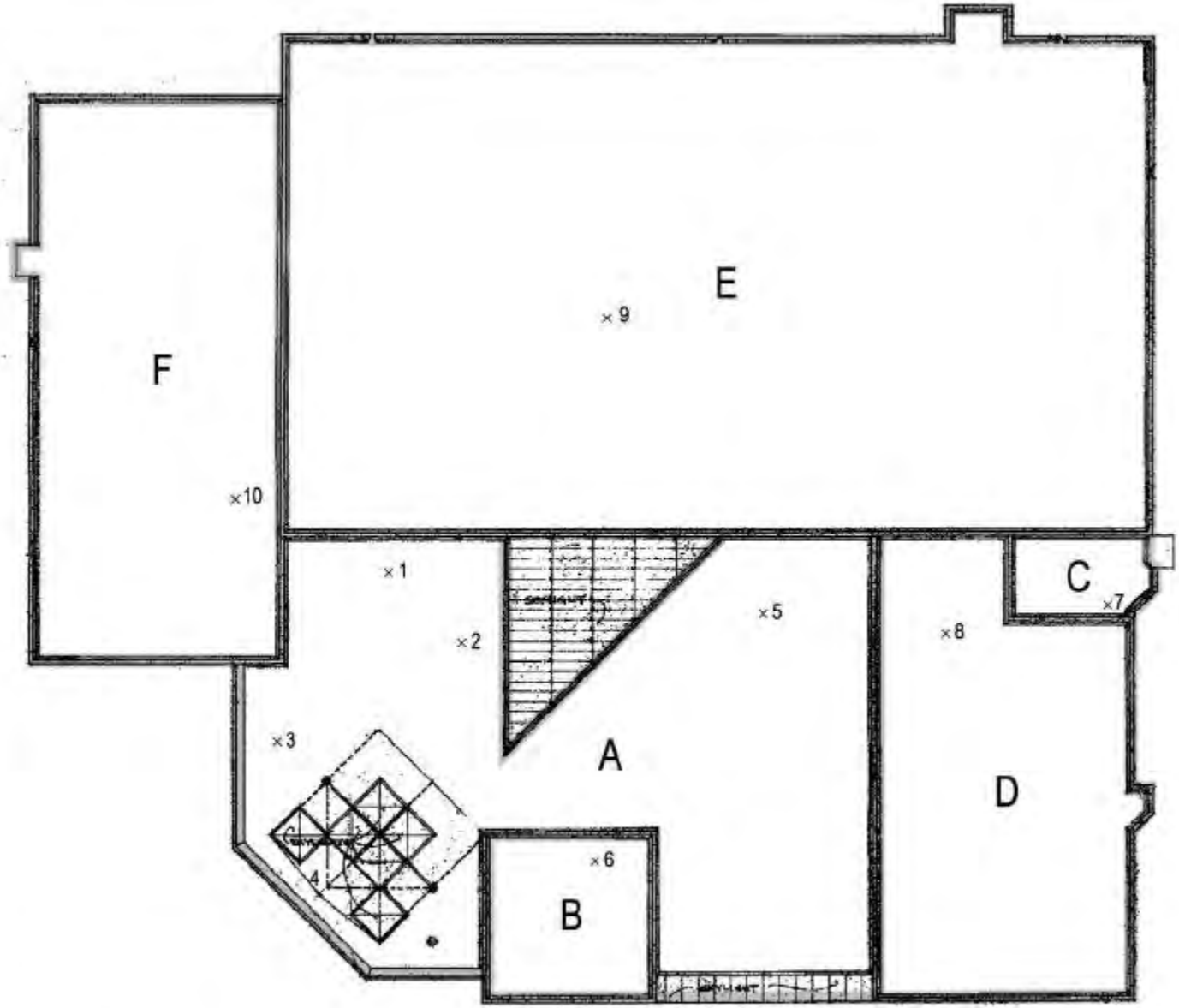
6. Face-fasten copings with 3 fasteners per coping (1,440 lineal feet, 430 fasteners, $5 per fastener): $2,150

7. New ladder: $1,000

Skylight Recommendation

New skylights: $157,600

ROOFING AND SKYLIGHT SUBTOTAL **$337,530**



SCALE: 0 5'10' 25'

NORTH

EPSTEIN

A.EPSTEIN AND SONS INTERNATIONAL
600 WEST FULTON STREET
CHICAGO, IL 60661-1189
CHICAGO, LOS ANGELES, TEL AVIV
T: 312-454-9100 F: 312-559-1217

ROBERT CROWN CENTER
EVANSTON, IL

ROOF PLAN

PROJECT NUMBER:	DATE:
22288.01	01.01.03
SKETCH NUMBER:	DRAWN BY:
RSK-1	JGB

Section 10

Phase II – Refrigeration Recommendations

Phase II – Refrigeration Recommendations – Ice Rink

Recommendations:

Items of work that must be done:

Furnish and install a refrigerant detection system that is specific to refrigerant HCFC-22.
Refrigerant Gas Detector should be a Model 20 multi-channel monitor as manufactured by Manning Systems of Lenexa, Kansas. Three solid-state sensors should be provided with and connected by wiring to the gas detector. One sensor should be placed low on the wall by the door that leads to the ice rink arena. A second detector should be placed near the floor in the area of the indoor cooling tower water sump tank. The third detector should be placed in the refrigerant safety relief pipe that is connected to all safety relief valves inside the mechanical refrigeration room.

Estimate of cost:

ITEM NO.	DESCRIPTION	ESTIMATED COST
1.	Manning Model 20 with two solid-state room sensors and one Manning Model VL vent line sensor assembly.	$2,400
	Installation & wiring costs (labor + materials)	$3,400
	Commissioning	$900
	Total	$6,700.00

Furnish refrigeration machinery room ventilation emergency ventilation system. Exhaust fan to have capacity of 7,000 CFM. Fan shall be installed on the roof or high on the outside wall of machinery room. A motorized air damper shall be installed to allow air intake of 7,000 CFM. Fan and damper will be activated through control from the Refrigerant Gas Detector. Install air tight door between machinery room and ice arena. Install signage for refrigerant machinery room.

Estimate of cost:

ITEM NO.	DESCRIPTION	ESTIMATED COST
2.	7,000 CFM exhaust fan	$4,200
	Motorized damper and louver	$800
	Ventilation installation work (labor + materials)	$9,800
	Electrical installation work (labor + materials)	$4,200
	Door & general installation work (labor + materials)	$1,600
	Total	$20,600.00

Items of work that should be done within five years:

The compressors are in serviceable condition and could be serviced and repaired within normally expected cost range of $9,500 to $12,500 per year.

There are two shell & tube heat transfer bundles with each compressor unit. The condition of these units due to their age and service record is not nearly as good as the compressors. These shell and tube heat transfer units are commonly known as the evaporator and condenser bundles. Their function is to either reject heat from the refrigerant system to a water circuit, as in the case of the condenser; or to absorb heat into a refrigerant system from a water circuit as in the case of the evaporator.

Several pipes in each of the heat transfer units are already plugged so that refrigerant will not leak into the respective water circuit. Tubes that are plugged cannot act to reject or absorb heat. This results in inefficient refrigerant system operation. As more tubes need to be plugged, the system efficiency will degrade further and eventually the condensers and evaporators will have to be replaced. It is our estimation that since this process of plugging tubes has already begun total replacement will be recommended within 3-5 years. By that time the entire compressor/heat transfer packages will be beyond the normal service life of 24 years for this type of equipment (reference 1999 ASHRAE Handbook Chapter 35 Table 3).

In addition to these issues, it is a fact that the shell & tube bundles do not have sufficient space to store the entire refrigerant that is needed for operation at optimum efficiency under both the summer and winter ambient conditions. Because of the insufficient storage space, the charge

is currently set for the summer condition and not increased to allow maximum efficiency in the winter operating conditions. Installation of new equipment with the proper consideration for refrigerant density at both summer and winter conditions will allow the operation to be optimized during the heavy usage seen in the winter season.

The cost estimate to replace the 3 compressor/heat transfer packages is as follows:

Estimate of cost:

ITEM NO.	DESCRIPTION	ESTIMATED COST
3.	Compressor/Condenser/Evaporator packages (3)	$135,000
	Piping installation work (labor + materials)	$28,500
	Electrical installation work (labor + materials)	$8,500
	Total	$172,000.00

Based upon the improved efficiency of new compressor/condensing units versus the existing units we have estimated that slightly over 171,000 kWh of electric energy can be saved on an annual basis (assuming the rink operates 12 months per year). Presuming that the ComEd 6L rate structure is the basis for billing this amount of increased efficiency will result in approximately $18,825 of savings versus the existing equipment.

City of Evanston officials have informed us that a number of breaks in the rink piping system were patched 15 years ago. The current piping system was observed to be operating without any subsurface leaks. The service life normally expected for a schedule 40 steel pipe in the ice rink application is 30 to 40 years. The piping system has 15 years of life remaining.

With proper care and maintenance of the circulating fluid system and under normal operating conditions, the piping system is expected to be functional for another 15 years. This assumes the investment of the Refrigeration Subtotal stated above, as well as the ten year costs outlined in the chart on the next page. This is close to the life expectancy of the entire building. After 15 years, the City can expect that the complete piping system would have to be replaced. In today's dollars that cost is approximately $550, 000.

REFRIGERATION SUBTOTAL $199,300

FACILITY ASSESSMENT
REFRIGERATION EQUIPMENT

Component	Condition*	No. of Units	Approx. Age (Years)	Normal Expected Useful Life (Years)	Estimate of Remaining Useful Life (Years)	Est. of (1) Replacement Cost Immediate Needs	Estimate of (1) Replacement/ Rebuild Cost 10 Yr. Needs	Comments
Manning Model 20 Gas Detector	New		0	30	30	$6,700		New – Required by Code
Vent System	New		0	30	30	$20,600		New – Required by Code
Compressor Units		3	29	24	2-3	$172,000		
Cooling Tower	Satisfactory	1	2	17	15			New – Debris in Sump
Sump (Indoor)	Satisfactory	1	Unknown	20	Unknown		$3,500	
Circulating Pumps	Satisfactory	4	29	30	2-3		$22,000	

REFRIGERATION SUBTOTAL - $199,300
(immediate needs)

1) Based on Current Costs
(2) Included Electrical Hook-Up
* Categories
Satisfactory
Unsatisfactory
(3) See Recommendations
(4) Included on Supply Fan