FIRST DRAFT

PLANNING STUDY

FOR

ROCKINGHAM / HARRISONBURG REGIONAL JAIL ANNEX

HARRISONBURG, VIRGINIA

November 20, 2014

MOSELEY ARCHITECTS
A PROFESSIONAL CORPORATION

ARCHITECTURE • ENGINEERING • PLANNING • INTERIOR DESIGN • CONSTRUCTION SERVICES RICHMOND, VA.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

PLANNING STUDY
for
ROCKINGHAM/HARRISONBURG
REGIONAL JAIL ANNEX

SECTION I

Synopsis of the Required Number of Beds

I. SYNOPSIS OF THE REQUIRED NUMBER OF BEDS

A Community-Based Corrections Plan (CBCP) for the Rockingham / Harrisonburg Regional Jail was prepared in December 2014 by Moseley Architects. The planning forecast projected a bed need of 675 in 2029. The existing Regional Jail presently has an official Virginia Department of Corrections rated capacity of 208 beds, and had an average daily population of 450 at the end of FY-14. Currently, the Rockingham / Harrisonburg Regional Jail must send inmates to Middle River Regional Jail because their population is beyond the operational and design capacity of the existing jail. The Community-Based Corrections Plan recommends that projected crowding be addressed by implementing an aggressive community based strategy and expanding the current facility at a separate location.

Due to cost of the project, Rockingham County and the City of Harrisonburg have determined the construction will be done in phases to meet the forecast. Phase one, presented in this study, is for 315 beds. Enlarging the existing facility is not possible due to its downtown location, and a second location is planned in this Study.

The second facility will primarily be a minimum security, treatment and program based building. It will also house the entire women's population. Since there are only maximum and medium cells at the existing jail, the new facility will include male and female minimum security dormitories. A Mental Health housing unit for both men and women is also planned. The facility will include a less secure community custody wing which will be dormitory style housing for men and women participating in Work Release, Educational Release, Work Programs and Reentry. In addition, program, office, recreation, and multipurpose spaces will be sufficient to accommodate this program-oriented facility.

Proposed Bed Combination by Security Level: Detail						
MALE SECURE	No. of Pods	No. Beds per Pod	Housing Style: Single, Double, Quad, or Dorm	Total Beds	Existing or New	Total New Beds
Maximum Security	5	10	Single	50	Existing	0
Maximum Security Mental Health	1	9	Single, high ceiling	9	New	9
Maximum Security (Classification at New Facility)	1	10	Single	10	New	10
Maximum Security (Classification at exist)	1	10	Single	10	Existing	0
Medium Security	12	10	Single	120	Existing	0
Medium Security	2	8	Single	16	Existing	0
Medium Security	1	12	Single	12	Existing	0
Medium Security Mental Health	1	10	Single Cell	10	New	10
Minimum Security	3	40	Dorm	120	New	120
Male Secure Subtotal				**357**		**149**
Male Mental Health 19						

FEMALE SECURE	No. of Pods	No. Beds per Pod	Housing Style		Total Beds	Existing or New	Total New Beds
Maximum Security	1	6	Single	=	6	New	6
Maximum Security (Classification)	1	4	Single	=	4	New	4
Maximum Security Mental Health	1	4	Single Cell-one level		4	New	4
Medium Security	1	32	Single	=	32	New	32
Medium Security Mental Health	1	6	Single Cell-one level		6	New	6
Minimum Security	1	41	Dorm	=	41	New	41
Female Secure Subtotal				**=**	**93**		**93**
Female Mental Health 10							
Male and Female Secure (Gen Pop) Total				**=**	**450**		
Total Mental Health Housing = 29 (6.5% GEN POP)							

MALE NON SECURE - COMMUNITY CUSTODY	Number of Pods	No. Beds per Pod	Single, Double, Quad, or Dorm		Total Beds	Existing or New	Total New Beds
Work Release and Work programs	1	48	Dorm	=	48	New	48
Male Community Custody Subtotal				**=**	**48**		
FEMALE NON SECURE - COMMUNITY CUSTODY	Number of Pods	No. Beds per Pod	Single, Double, Quad, or Dorm		Total Beds	Existing or New	Total New Beds
Work Release & Work Program	1	12	Dorm	=	12	New	12
Female Community Custody Subtotal				**=**	**12**		
FLEX (MALE or FEMALE) NON SECURE - COMMUNITY CUSTODY	Number of Pods	No. Beds per Pod	Single, Double, Quad, or Dorm		Total Beds	Existing or New	Total New Beds
Community Custody	1	13	Dorm	=	13	New	13
Flex Community Custody Subtotal				**=**	**13**		
Male and Female Community Custody Total				**=**	**73**		
Grand Total				**=**	**523**		**315**

MALE / FEMALE SPECIAL HOUSING	Number of Pods	No. Beds per Pod	Single, Double, Quad, or Dorm		Total Beds	Existing or New	Total New Beds
Existing Special Housing	3	Varies	Single		20	Existing	0
Segregation Female	1	6	Single	=	6	New	6
Segregation Male	1	6	Single	=	6	New	6
Protective Custody/Juvenile	1	3	Single	=	3	New	3
Medical	1	10	Single, and Group	=	10	New	10
Special Housing - 10% of G.P.				**=**	**45**		**25**

At the conclusion of this project, the entire Rockingham-Harrisonburg bed distribution will be as follows

PHASE 1 CLASSIFICATION BREAKDOWN

MEN CLASSIFICATION (80%)		**WOMEN CLASSIFICATION (20%)**		**TOTAL CLASSIFICATION (100%)**	
Maximum	79	Maximum	14	Maximum	93
	19%		*13%*		*18%*
Medium	158	Medium	38	Medium	196
	38%		*36%*		*37%*
Minimum*	181	Minimum*	53	Minimum*	234
General Pop 120		General Pop 41		General Pop 162	
Com. Cus. 61		Com. Cus. 12		Com. Cus. 73	
	43%		*51%*		*45%*
Total	418	Total	105	Total	523

*Minimum Classification includes less secure "Community Custody Beds" & General Population

Total General Population	450
Total Community Custody	73
Grand Total	523

SECTION II

Direct Supervision

II. DIRECT SUPERVISION STATEMENT

The direct supervision/unit management concept is being considered for the minimum security dormitories in this Project. Maximum and medium security housing units in the new facility will utilize indirect supervision, like the existing facility for which the correctional officers are already trained.

SECTION III
Facility Planning Program

III. FACILITY PLANNING PROGRAM

A. SUMMARY OF SPACE REQUIREMENTS

1.0 Public Lobby
2.0 Facility Administration
3.0 Employee Services
4.0 Security
5.0 Law Enforcement Lobby
6.0 Intake and Transport
7.0 Vehicle Sallyport
8.0 Community Custody
9.0 Inmate Records / Classification
10.0 General Housing
11.0 Special Purpose Housing
12.0 Visitation
13.0 Education
14.0 Recreation
15.1 Medical Services
15.2 Medical Holding
16.0 Food Services
17.0 Laundry
18.0 Maintenance
19.0 Warehouse
20.0 Central Plant

B. SPECIAL DESIGN CONSIDERATIONS

III. FACILITY PLANNING PROGRAM

The following planning program is organized by major functions and is designed as a 315 bed annex to the existing jail, with core space added to selected components. These additional core spaces are identified in the program, and are further described in Part B “Special Design Considerations” of this section.

The program has been compiled to conform to applicable provisions of the Virginia Department of Corrections *Standards for Planning, Design, Construction and Reimbursement of Local Correctional Facilities*, 1994 edition. It is based on the formula of 400 square feet per bed, and verified with the stated needs of the localities.

Consideration was given to the requirements of the latest edition of the Virginia Uniform Statewide Building Code, / 2012 International Building Code (IBC) along with the requirements of the ANSI A117 accessibility requirements.

A. SUMMARY OF SPACE REQUIREMENTS

FACILITY PLANNING PROGRAM - 315 Beds						
SUMMARY OF SPACE REQUIREMENTS - NEW CONSTRUCTION						
COMPONENT		Base NSF Area	Core Space	Total NSF	Grossing Factor	Total GSF
1.	Public Lobby	995	0	995	1.25	1,244
2.	Facility Administration	1,760	200	1,960	1.35	2,646
3.	Employee Services	3,520	1,725	5,245	1.35	7,081
4.	Security	2,075	0	2,075	1.35	2,801
5.	Law Enforcement Lobby	325	0	325	1.60	520
6.	Intake and Transport	3,970	2,900	6,870	1.60	10,992
7.	Vehicle Sallyport	800	725	1,525	1.10	1,678
8.	Inmate Records/Classification	545	260	805	1.35	1,087
9.	Community Custody	11,450	0	11,450	1.55	17,748
10.	General Housing	29,585	0	29,585	1.65	48,815
11.	Special Purpose Housing	1,560	0	1,560	1.75	2,730
12.	Visitation	1,040	0	1,040	1.35	1,404
13.	Education	2,280	0	2,280	1.25	2,850
14.	Recreation	2,000	0	2,000	1.20	2,400
15.1	Medical Services	2,135	545	2,680	1.40	3,752
15.2	Medical Holding	1,380	0	1,380	1.75	2,415
16.	Food Services	4,250	3,945	8,195	1.10	9,015
17.	Laundry	1,180	1,170	2,350	1.10	2,585
18.	Maintenance	1,280	0	1,280	1.10	1,408
19.	Warehouse	5,290	0	5,290	1.10	5,819
20.	Central Plant	4,740	0	4,740	1.10	5,214
	Subtotals	**82,160**	**11,470**	**93,630**		**134,204**
	Overall Gross SF - Jail Base Bldg.					**119,429**
	Overall Gross SF - Jail Future Core Space					**14,775**
	Overall Gross SF - Jail Base Bldg. + Future Core					**134,204**
	Gross SF x overall grossing factor (OGF) = 8%		GSF x	0.08	**=**	10,736
	Total Gross Square Footage - Jail					**144,940**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
1. PUBLIC LOBBY			
Lobby - seating for 30	1	500	500
Security desk - visitor check-in	1	100	100
Weather vestibule	1	75	75
Locker - storage area	1	20	20
Public men's & women's rooms	2	150	300
TOTAL			**995**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
2. FACILITY ADMINISTRATION			
Deputy jail administrator	1	120	120
Chief of security	1	120	120
Chief of programs & services	1	120	120
Administrative (programs)	1	120	120
Information technology office	1	120	120
Security lieutenant*			0
Clerk/receptionist	1	80	80
Waiting	1	80	80
Clerk	1	80	80
Records/files	1	120	120
Kitchenette	1	80	80
Chair/table storage	1	80	80
Conference room (12 people +/-)	12	25	300
Copier/mail	1	140	140
General storage	1	80	80
Staff restrooms	2	60	120
Future core office/ storage	*2*	*100*	*200*
Subtotal			**1760**
Additional area for future core			**200**
TOTAL			**1960**

*Office located inside secure perimeter, and included in Component 4. Security

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
3. EMPLOYEE SERVICES			
Muster / Training (size for 60)	60	20	1200
Mail/ Radio Storage	1	120	120
Chair/Table/Audio Visual Storage	1	60	60
Male Lockers (for security staff)	75	9	675
Male Toilet & Shower	1	250	250
Female Lockers (for security staff)	30	9	270
Female Toilet & Shower	1	175	175
Staff Break/ Vending	1	200	200
Janitor's Closet	1	30	30
Storage	1	80	80
Safety/ Certification Officer	1	100	100
Storage (Safety & Certification)	1	60	60
Defensive Tactics Training	1	300	300
Future core staff break/ vending	*1*	*200*	*200*
Muster / Training (size for 20 more)	*20*	*20*	*400*
Male Lockers (for security staff)	*80*	*9*	*720*
Female Lockers (for security staff)	*45*	*9*	*405*
Subtotal			**3520**
Additional area for futue core			**1725**
TOTAL			**5245**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
4. SECURITY			
Master control with toilet	1	250	250
Security electronics room (main)	1	120	120
Security electronics closet (satellite)	2	80	160
Riot gear/air pack/tear gas (outside secure perimeter)	1	150	150
Armory / locksmith (outside secure perimeter)	1	180	180
Security lieutenant	2	120	240
Shift supervisor (sergeant) open office - 4 desks w/ files	4	65	260
Support services supervisor (sergeant) open office - share space in open office above	1	65	65
Records/files	1	100	100
Staff toilet	2	50	100
Kitchenette	1	60	60
Evidence vault	1	40	40
General storage/supplies/copier	1	80	80
Jail investigator office	1	120	120
Pre-trial workers office (shared for 2)	1	150	150
TOTAL			**2075**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
5. LAW ENFORCEMENT LOBBY			
Report writing counter & chairs	1	90	90
Bench with cuff bar	1	60	60
Breathalyzer	1	75	75
Fingerprint / photo room / DNA *	1	100	100
TOTAL			**325**

*Shared with jail - provide access from both sides

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
6. INTAKE AND TRANSPORT			
Processing counter	1	100	100
Intake / transport supervisor office	1	110	110
Intake / transport officer workstations	2	35	70
Dress-out rooms (pass-thru to property stor)	2	35	70
Group holding for 8 (transport)	2	150	300
Temporary holding - single	10	60	600
Temporary holding detox single cell	6	80	480
Clothing exchange/shower/search	2	70	140
Property storage	1	1000	1000
Secure storage closet (valuables)	1	20	20
Computer workstation/desk in property storage	1	50	50
Washer/dryer niche in property stor	1	30	30
Clothing/personal hygiene issue	1	150	150
Medical screening	1	90	90
Video arraignment	1	80	80
Video arraignment staging/waiting	1	180	180
Staff toilet	1	50	50
Inmate toilet	1	50	50
Equipment / supply / storage	1	50	50
Video magistrate	1	80	80
Interview	1	80	80
Classification officer office	1	110	110
Sallyport to VSP	1	80	80
Future core clothing/personal hygiene issue	*1*	*100*	*100*
Future core single holding	*11*	*60*	*660*
Future core open seating with cuff bar	*11*	*45*	*495*
Future core property storage	*1*	*1400*	*1400*
Future core intake / transport officer workstation	*2*	*35*	*70*
Future core dress-out room	*1*	*35*	*35*
Future core clothing exchange/shower/search	*2*	*70*	*140*
Subtotal			**3970**
Additional area for futue core			**2900**
TOTAL			**6870**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
7. VEHICLE SALLYPORT			
Sized for one school bus	1	725	725
Detainee toilet with shower / eyewash	1	75	75
Future core sized for 2 vehicles	*1*	*725*	*725*
Subtotal			**800**
Additional area for futue core			**725**
TOTAL			**1525**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
8. INMATE RECORDS/CLASSIFICATION			
LIDS & classification supervisor	1	100	100
LIDS/classification clerks	2	60	120
Records storage	1	200	200
Copier & VCIN	1	75	75
Staff Toilet (Unisex)	1	50	50
Future core records storage	*1*	*200*	*200*
Future core LIDS/classification clerks	*1*	*60*	*60*
Subtotal			**545**
Additional area for futue core			**260**
TOTAL			**805**

Note: Files stored in high density filing system

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
9. COMMUNITY CUSTODY			
Support Space:			
Work release lobby (seating for 20)	20	20	400
Work release/weekenders booking counter	1	150	150
Community custody supervisor	1	120	120
Community custody office	2	100	200
Programs office	1	120	120
H.I.P. office	1	100	100
H.I.P. equipment closet	1	15	15
H.I.P. restroom	1	50	50
Shower/search/toilet	3	80	240
Locker room -men (double tier)	1	125	125
Locker room - women (double tier)	1	80	80
Interview rooms / contact visit room	2	80	160
Staff toilet (men and women)	2	50	100
Multipurpose / classroom	1	400	400
Multipurpose / recreation	1	1000	1000
Storage	2	60	120
Toilet with shower off rec room & classroom	3	80	240
Laundry room for work clothes (men and women)	2	100	200
Janitor closet	2	30	60
Sallyport to secure perimeter	2	100	200
Male Housing (48):			
Dormitory	48	85	4080
Toilets/lavs/showers (4 of each)	1	400	400
Washer / dryer niche	1	30	30
Officer station	1	50	50
Video visit	3	25	75
Flex Housing (Male or Female - 13):			
Dormitory	13	85	1105
Toilets/lavs/showers (2 of each)	1	200	200
Washer / dryer niche	1	30	30
Officer station	1	50	50
Video visit	1	25	25
Female Housing (12):			
Dormitory	12	85	1020
Toilets/lavs/showers (2 of each)	1	200	200
Washer / dryer niche	1	30	30

COMPONENT/SPACE (Continued)	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
Officer station	1	50	50
Video visit	1	25	25
TOTAL			**11450**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
10. GENERAL HOUSING			
Female Housing (Maximum) 6- 1 unit			
Cell	6	80	480
Dayroom	6	35	210
Dayroom Showers	1	35	35
Dayroom Toilet	1	30	30
Video Visitation	1	25	25
Sallyport	1	50	50
Female Housing (Max Classification) 4 - 1 unit			
Cell	4	80	320
Dayroom	4	35	140
Dayroom Showers	1	35	35
Dayroom Toilet	1	30	30
Video Visitation	1	25	25
Sallyport	1	50	50
Female Housing (Medium) 32 - 1 Unit			
Cell	32	80	2560
Dayroom	32	35	1120
Dayroom Showers	3	35	105
Dayroom Toilet	1	30	30
Storage	1	40	40
Video Visitation	2	25	50
Sallyport	1	50	50
Female Housing (Minimum) 41- 1 Unit			
Dormitory	41	85	3485
Washer/Dryer niche	1	30	30
Toilets/Lavs/Showers (4 or each)	1	400	400
Janitor	1	25	25
Video Visitation	3	25	75
Storage	1	40	40
Officer station	1	50	50

COMPONENT/SPACE (Continued)	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
Indirect Housing Control			
Control Room for Female	1	150	150
Control Room Toilet	1	50	50
Janitor closet	1	30	30
Male Housing (Max classification) 10 - 1 Unit			
Cell	10	80	800
Dayroom	10	35	350
Dayroom Showers	2	35	70
Dayroom Toilet	1	30	30
Storage	1	40	40
Video Visitation	1	25	25
Sallyport	1	50	50
Male Housing (Minimum) 120 - 3 Units			
Dormitory	40	85	3400
Washer/Dryer niche	1	30	30
Toilets/Lavs/Showers (4 of ea)	1	400	400
Janitor	1	25	25
Video Visitation	3	25	75
Storage	1	40	40
Officer station	1	50	50
Dormitory	40	85	3400
Washer/Dryer niche	1	30	30
Toilets/Lavs/Showers (4 of ea)	1	400	400
Janitor	1	25	25
Video Visitation	3	25	75
Storage	1	40	40
Officer station	1	50	50
Dormitory	40	85	3400
Washer/Dryer niche	1	30	30
Toilets/Lavs/Showers (4 of ea)	1	400	400
Janitor	1	25	25
Video Visitation	3	25	75

COMPONENT/SPACE (Continued)	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
Storage	1	40	40
Officer station	1	50	50
Mental Health Housing - Female Max (4)			
Cell	4	80	320
Dayroom	4	35	140
Dayroom Showers	1	40	40
Dayroom Toilet	1	25	25
Video Visitation	1	25	25
Mental Health Housing - Female-Medium (6)			
Cell	6	80	480
Dayroom	6	35	210
Dayroom Showers	1	40	40
Dayroom Toilet	1	25	25
Video Visitation	1	25	25
Mental Health Housing - Male Max (9)			
Cell	9	80	720
Dayroom	9	35	315
Dayroom Showers	2	40	80
Dayroom Toilet	1	25	25
Video Visitation	1	25	25
Mental Health Housing - Male Medium (10)			
Cell	10	120	1200
Dayroom	10	35	350
Dayroom Showers	2	40	80
Dayroom Toilet	1	25	25
Video Visitation	2	25	50
Mental Health Housing - Support			
Control Room for (Male & Female)	1	150	150
Control Room Toilet	1	50	50
Shared sallyport for housing units	1	200	200

COMPONENT/SPACE (Continued)	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
Storage	1	100	100
Open nurse station and nurse assistants	1	150	150
Secure storage (meds)	1	30	30
Janitor	1	30	30
Craft room (8 inmates)	1	300	300
Classroom / program / group counseling (8 inmates)	1	300	300
Individual counseling / meeting room	2	70	140
Observation room for staff	1	70	70
Social workers office (shared for 2)	1	150	150
Therapist /counselors office - shared	1	150	150
Classroom / program space (12 inmates)	1	420	420
TOTAL			**29585**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
11 SPECIAL PURPOSE HOUSING (Segregation)			
Segregation - Female (6) - 1 unit			
Single Cell	6	80	480
Showers	1	35	35
Sallyport	1	50	50
Segregation - Male (6) - 1 units			
Single Cell	6	80	480
Showers	1	35	35
Sallyport	1	50	50
Protective Custody / Juvenile (3) - 1 unit			
Single Cell	3	80	240
Dayroom	3	35	105
Showers	1	35	35
Sallyport	1	50	50
TOTAL			**1560**

Note: Special Purpose Housing is 10% of General Population and includes 10 beds in Medical.
Medical Housing beds are included in Component 15.2 "Medical Holding"

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
12. VISITATION			
Contact visit (window and paper pass) *	3	60	180
Contact visit (open room)	1	60	60
Non-contact visiting	14	30	420
Inmate search room	1	40	40
Public search	1	40	40
Future core Non-Contact Visiting	*6*	*30*	*180*
*Future core contact visit (window and paper pass)**	*2*	*60*	*120*
Subtotal			**740**
Additional area for futue core			**300**
TOTAL			**1040**

*Calculation based on VDOC standards = 315 population minus 73 Community Custody beds = 242
* Lockable paper pass - staff to lock & unlock

Video Visitation will be used for non-contact visitation

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
13. EDUCATION			
Classroom	4	400	1600
Library / Law Library	1	100	100
Storage Closet	4	30	120
Inmate Toilet	1	50	50
Teacher / Staff Toilet	2	50	100
Volunteer / Teacher Workroom (outside perimeter)	1	150	150
Copy / Supply Room (outside perimeter)	1	120	120
Teacher / Volunteer Lockers / (outside perimeter)	1	40	40
TOTAL			**2280**

NOTE: DOC Standard for total Educational/Multi-purpose/Recreation/Program Space is
30 NSF x # of General Population inmates: 315 - 73 = 242 inmates
(Community Custody beds are not required to have 30 NSF per inmate)

242 x 30 = 7,260 NSF
1,160 NSF is provided in Mental Health Housing, Component 10.0
9,100 NSF is provided in "Recreation", Component 14.0
1,700 NSF is provided in "Education", Component 13.0
Total 9,100 + 1,700 + 1,160 = 11,960 NSF

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
14. RECREATION			
Indoor Recreation (Men's & Women's)	2	1000	2000
Outdoor Rec	1	1500	not counted
Outdoor Rec	8	700	not counted
TOTAL			**2000**

Note: Outdoor Recreation not counted in building's NSF

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
15.1 MEDICAL SERVICES			
Inmate waiting vestibule	1	80	80
Mental health professional offices	3	110	330
Medical professional office	1	110	110
Dental office	1	110	110
Nurse office	1	150	150
Nurse station	1	100	100
Records storage	1	100	100
Supplies/copier/workroom	1	100	100
Staff toilet	2	50	100
Inmate toilet	1	50	50
Exam with sink	2	90	180
Dental suite for 1 chair	1	120	120
Dental lab	1	100	100
Dental compressor	1	40	40
Laboratory	1	120	120
Pharmacy	1	140	140
General storage / supplies	1	50	50
Clean linen	1	25	25
Dirty linen	1	25	25
Refuse (contaminated)	1	25	25
Wheelchair/gurney storage	1	50	50
Janitor's closet	1	30	30
Future core mental health professional office	*1*	*110*	*110*
Future core general storage / supplies	*1*	*75*	*75*
Future core exam with sink	*1*	*90*	*90*
Future core records storage	*1*	*100*	*100*
Future core dental suite for 1 chair	*1*	*120*	*120*
Future core nurse station	*1*	*50*	*50*
Subtotal			**2135**
Additional area for futue core			**545**
TOTAL			**2680**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
15.2 MEDICAL HOLDING			
Medical Housing (10)			
2 person accessible cell with shower	2	185	370
Pressurized cell (accessible)	2	90	180
Ante room with shower / lavatory	2	80	160
Inmate shower area	1	120	120
Single medical cell (accessible)	4	90	360
Detox Housing (6)*			
Detox cell*	6		0
Inmate shower area	1	90	90
Support / Security			
Medical Security Station	1	60	60
General Storage	1	40	40
TOTAL			**1380**

* Locate close to intake. Areas are counted in Component 6 "Intake & Transport"

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
16. FOOD SERVICE			
Food Service Manager	1	120	120
Staff Restroom/Locker	1	80	80
Receiving	1	140	140
Trash/Recycle/Can wash	1	80	80
Dry Storage (Bulk)	1	400	400
Secure Storage	1	60	60
Walk-In Freezer	1	260	260
Walk-In Refrigerators	1	220	220
Production Area	1	1100	1100
Tray Assembly	1	260	260
Food Cart Staging/Storage	1	180	180
Cart Wash	1	100	100
Dishwash/Pot Wash	1	320	320
Janitor/Chemical Storage	1	80	80
Inmate Restroom	1	50	50
Inmate Break Area	1	100	100
Staff Dining	1	400	400
Staff Serving	1	160	160
Staff Toilets	2	50	100
Vending Area in Staff Dining	1	40	40
Future core-Food Service Manager	*1*	*40*	*40*
Future core - Receiving	*1*	*160*	*160*
Future core-Trash/Recycle/Can wash	*1*	*100*	*100*
Future core-Dry Storage (Bulk)	*1*	*425*	*425*
Future core-Secure Storage	*1*	*80*	*80*
Future core-Walk-In Freezer	*1*	*320*	*320*
Future core-Walk-In Refrigerators	*1*	*280*	*280*
Future core-Production Area	*1*	*850*	*850*
Future core-Tray Assembly	*1*	*270*	*270*
Future core-Food Cart Staging/Storage	*1*	*270*	*270*
Future core-Dishwash/Pot Wash	*1*	*380*	*380*
Future core-Janitor/Chemical Storage	*1*	*40*	*40*
Future core-Inmate Restroom	*1*	*50*	*50*
Future core-Inmate Break Area	*1*	*100*	*100*
Future core-Staff Dining	*1*	*480*	*480*
Future core--Staff Serving	*1*	*100*	*100*
Subtotal			**4250**
Additional Area for future core			**3945**
TOTAL			**8195**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
17. LAUNDRY			
Wash Equipment	1	160	160
Drying Equipment	1	100	100
Folding/Work Area	1	160	160
Chemical Supply/Janitor	1	80	80
Handling/Sorting/Carts	1	200	200
Mending	1	60	60
Supervisor	1	80	80
Clean Storage *	1	150	150
Inmate Restroom	1	50	50
Staff Restroom	1	50	50
Break Area	1	90	90
Future core-Wash Equipment	*1*	*200*	*200*
Future core-Drying Equipment	*1*	*200*	*200*
Future core-Folding/Work Area	*1*	*200*	*200*
Future core-Chemical Supply/Janitor	*1*	*40*	*40*
Future core-Handling/Sorting/Carts	*1*	*250*	*250*
Future core-Mending	*1*	*60*	*60*
future core-Supervisor	*1*	*20*	*20*
*Future core-Clean Storage *	*1*	*200*	*200*
Subtotal			**1180**
Additional Area for future core			**1170**
TOTAL			**2350**

* Assumes new bulk items located in warehouse

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
18. MAINTENANCE			
Office	1	100	100
Open Office/Clerk *	1	150	150
Supplies	1	10	10
Staff Restroom (Unisex)	1	50	50
Staff Lockers	4	5	20
Kitchenette	1	30	30
Inmate Toilet	1	50	50
Janitor's Closet	1	30	30
Eyewash Station	1	10	10
Multipurpose Shop w/ mop sink	1	300	300
Tools	1	80	80
Electronics/Communications Shop	1	150	150
Yard Equipment **	1	300	300
TOTAL			**1280**

* Provide space for two desks, copier.
** Provide outside access to this area (overhead door desired). Area will be for smaller equipment.

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
19. WAREHOUSE			
Main Storage	1	3500	3500
Commissary	1	300	300
Warehouse office	1	110	110
Commissary workstation	1	80	80
Receiving Sallyport	1	600	600
Covered Loading Dock	1	600	600
Staff Toilet Room	1	50	50
Inmate Toilet Room	1	50	50
TOTAL			**5290**

COMPONENT/SPACE	NO. OF SPACES	NSF (Per Standard)	TOTAL NSF
20. CENTRAL PLANT			
Mechanical Equipment (boilers, chillers, water heaters)	1	2200	2200
Main Electrical Equipment Room	1	700	700
Smoke Control Electrical / Generator Room	1	400	400
Branch Electrical Closets	4	80	320
Emergency Generators (outdoor units)	---	---	0
Kitchen P/Bd. and Transformers	1	64	64
Main Computer/Phone Equipment Room	1	250	250
Branch Computer/Phone Equipment Room	4	64	256
Pneumatic lock equipment	1	150	150
Sprinkler Risers	1	200	200
Sprinkler pump room (if needed)	1	200	200
TOTAL			**4740**

Assumes rooftop air handlers

B. SPECIAL DESIGN CONSIDERATIONS

The facility will house 73 community custody inmates, and 161 minimum security inmates in dormitories. 234 of the 315 beds will be dormitories, fulfilling the County and City need for this type of housing. A separate entrance for Work Release and Alternative Sentencing (Community Custody) is needed, and this housing area of the facility will be designed to the Community Custody Standards in the VDOC *Standards.* The Community Custody housing is separated from the main jail by a sallyport and a perimeter security wall. This wing will have its own program space, visiting area, and outdoor recreation yard.

Certain areas of a detention facility are especially difficult to enlarge and renovate in a fully operational facility. For example, construction is very disruptive to operations in the kitchen and laundry where the functions can't stop, and outsourcing is expensive and inefficient for extended periods of time. Intake and medical are two more departments that must remain operational and secure at all times. Their designs don't lend themselves to an easy expansion because they have specific adjacencies, sight lines, circulation, and inmate processing and movement planned into the layout, and the intake department is always connected to a Vehicle Sallyport on the exterior wall. Visitation and staff locker rooms are normally embedded in the middle of the building, and impossible to enlarge without affecting adjacent spaces. Adding to and renovating these core spaces normally requires extra security officers on duty for the duration of construction to monitor contractors, escort, and check them in and out daily. This is an additional expense to the facility that is on and above the premium that contractor's charge to work in an occupied secure facility.

These areas are labeled "core", and the Virginia Department of Corrections recognizes the difficulty in adding to these areas later. For that reason, they encourage localities and participate in reimbursement for building core space large enough to handle future need (noted as "future core"). It is a long range, economically sensible planning approach when possible. These planning strategies are built into this program and design.

To meet the programmatic goals of the community for this facility, classroom, program, and recreation space is provided beyond the minimum Department of Corrections standards. Most of the housing units have an attached outdoor recreation yard. This will enable staff the flexibility to schedule outdoor exercise more regularly and in small groups. The recreation yards will also be a source of natural light into the housing units.

The new facility must be fully accessible and in compliance with requirements of the Building Code and the Americans with Disabilities building standards.

The federal Prison Rape Elimination Act (PREA) went into effect August, 2012. Section 115.318 is applicable to the design of this project, and must be a consideration in the final design layout. It states:

115.318 Upgrades to Facilities and Technologies

(a) When designing or acquiring any new facility and in planning any substantial expansion or modification of existing facilities, the agency shall consider the effect of the design, acquisition, expansion, or modification upon the agency's ability to protect residents from sexual abuse.

SECTION IV

Site Characteristics

A. SITE SIZE AND LOCATION
B. EXISTING FEATURES AND USES
C. AVAILABILITY OF UTILITIES
D. GEOTECHNICAL REPORT
E. SITE FEATURES IMPACTING DESIGN OR COST

IV. SITE CHARACTERISTICS

A. SITE SIZE AND LOCATION

Located at approximately 38°-23'-40" north latitude by 78°-53'-36" west longitude, the proposed site is located off of State Route 707 (Willow Spring Road) in the City of Harrisonburg, Virginia, approximately 4.0 miles south-southwest of the town center. The proposed site is currently owned by the County of Rockingham, and the area selected lies immediately to the west of the Rockingham County Landfill.

Two industrial parcels, separated by an existing railroad right-of-way, bound the proposed site to the west; three industrial parcels border this site to the southwest; agricultural land borders the site to the south; and the existing Rockingham County Landfill borders the site to the east and north. The County owned land, on which this facility will be situated, comprises approximately 85 acres in total; 69 acres of which is located in the City, with the remaining 16 located in the County. The northern portion of this site, located entirely within the City, has been chosen for this project's siting.

For the purpose of this study, readily available topographic and boundary information was compiled for use. While this data is sufficient for planning purposes, a site specific topographic and boundary survey will be completed prior to the development of the final design and construction documents.

B. EXISTING FEATURES AND USES

ZONING AND OWNERSHIP

The site is currently owned by the County of Rockingham, and is currently zoned M-1, General Industrial District, as defined by the City of Harrisonburg. It is anticipated that the proposed jail will be classified under Section 10-3-96, of the City of Harrisonburg Zoning Ordinance, "Uses permitted by right", Item 17, "Public uses".

Minimum setbacks, per Section 10-3-98, of the City of Harrisonburg Zoning Ordinance, shall be:

Front—Thirty (30) feet.

Side—Ten (10) feet, except on the side of a lot abutting a residential district, then thirty (30) feet; provided that for any structure greater than thirty-five (35) feet in height which abuts a residential district, then one (1) additional foot of setback is required for each foot above thirty- five (35) feet.

Rear—Ten (10) feet, except on the side of a lot abutting a residential district, then thirty (30) feet; provided that for any structure greater than thirty-five (35) feet in height which abuts a residential district, then one (1) additional foot of setback is required for each foot above thirty- five (35) feet.

The Maximum building height, per this same Code, shall be:

Seventy-five (75) feet unless superseded by special use permit 10-3-97(12).

The site, as currently designed, will meet or exceed all of these requirements and based upon the preliminary layout. It is felt that no further increase in what is being proposed be sought.

SITE ACCESS

Primary access to the proposed site will be provided via a new, single, commercial entrance constructed on State Route 707, Willow Spring Road, where it borders the proposed site. Due to limited existing traffic on the street and limited proposed traffic associated with the development, other roadway improvements/turning lanes are not anticipated. This lone entrance will serve all users into the facility, including visitors, staff, product/service delivery and pick-up, and prisoner transport.

Once on the site, traffic will be directed to a loop road around the facility taking them to their ultimate destination for delivery, pick-up, or parking. This loop will also serve to provide fire protection access to the facility, and all supporting facilities being proposed, or planned for with future expansion.

GEOLOGY, SOILS, AND TOPOGRAPHY

The proposed site is currently cleared of all trees, with minor exceptions, and consists of moderately sloping topography with topographic relief ranging from an elevation of approximately 1,260 feet (mean sea level, MSL) on the lower portion of the site, along the western boundary, to an approximate high elevation of 1,320 along the eastern site limits. Given the elevation changes on this site, grading will be required to create a suitable building pad site, as well as parking and roadways as proposed. Finished grades for all proposed building pads, roadways, and parking areas will not exceed standards for those individual items. Preliminary grading of the site shows that all necessary improvements can be achieved without retaining walls, or the need to place fill on the proposed wall systems of the facility. Grading will also provide for the flow of stormwater away from any structure either by surface flow, or the installation of storm sewer systems.

A preliminary, limited geotechnical report is underway for the proposed site. It is not available for inclusion in the “First Draft” printing of this study.

The soils in the area of the proposed facility appear to be comprised of Frederick and Lodi silt loams, based upon USDA Soils information. This soil make-up has moderate permeability and available water capacity. Shrink-swell potential ranges from moderate to high and will be considered based upon the recommendations of the yet-to-be completed geotechnical report.

WATER RESOURCES

A wetlands assessment has been performed on the site, as a whole, and while wetlands have been noted on this site, they are not in the area being considered for this facility. No grading, or any other activity, is planned in these noted areas. Buffers, while not required, will be provided in the final design to limit the potential for unplanned impact on these areas.

STORMWATER

It is anticipated that a combination of swales and storm collection/piping systems will collect stormwater runoff from the proposed development and discharge into a new stormwater management facility, to be located on the lower portion of the proposed site. This proposed stormwater management facility will provide both quantity and quality control in accordance with all applicable State regulations. The final placement of this facility will be determined during the site design process to allow for discharge into an adequate channel as required. This final placement may require additional quantity control, based upon the capacity of the receiving channel.

Stormwater quality will be provided on site, and it will be in accordance with the newly enacted Chesapeake Bay TMDL Regulations and VSMP requirements. This will address quality during both the construction process and post-construction timing. This project will be classified as a new development project and be subject to full applicability of the regulations. Stormwater quality will be achieved through a combination of both natural methods and the use of approved proprietary BMP's. This final combination of methods will be addressed during the final site design, with ultimate approval coming from the appropriate jurisdiction having authority.

ENVIRONMENTAL AFFECTS OF ADJACENT LANDFILL

Through discussions with the County's Public Works Department, it is understood that the underground methane produced by the County's landfill operation has shown no signs of migrating onto the subject property. Monitoring wells are installed just northwest of the subject site, and have shown no cause for concern of this becoming an issue. The landfill has methane vents that pump out the gas upon production, thus mitigating any potential for underground migration in the direction of the proposed facility. No vapor barriers or the like are understood to be necessary for the facility at this time.

DEQ was consulted on the matter of groundwater contamination. Though no DEQ permits will be required for construction, the presence of low-level organic volatiles in the site's groundwater warrants the recommendation for a vapor barrier to be installed under the building slab, to avoid any possible vapor intrusion into the facility. OSHA requirements on the subject may affect architectural implementation. Architectural design should address potential leakage at floor joints. Increased air exchange may also be recommended based upon formal testing during the design phase.

C. AVAILABILITY OF UTILITIES

WATER

The proposed site for this facility is within the limits of the City of Harrisonburg. Public water is available via a proposed connection to an existing 12" ductile iron water main that is runs in an east/west direction and is adjacent to the southern bounds of our site, as well as a second 12" ductile iron water main that runs in a north/south direction and bisects our chosen site. Discussions with the City of Harrisonburg lead us to anticipate no issues with pressure or available flows, but a site specific water pressure test has been requested for use in the final design. Also, during final design, efforts will be made to allow for building and infrastructure construction to take place without negatively impacting the existing 12" water main that bi-sects the site thereby avoiding any relocation of that main.

It is anticipated that an 8" ductile iron water main will be constructed with this facility to provide both domestic and fire suppression flows. Given the proximity of the 2 - 12" mains, consideration will be given to completing a loop of the proposed 8" water main to help ensure water flows are available in the case of a water main break or scheduled maintenance. The water main entering the site and serving any proposed fire hydrants will be placed in a water easement, and ownership/maintenance of that main will transfer to the City of Harrisonburg. At a point on this main, closest to the proposed mechanical room within the facility, a single water meter will be provided for all domestic uses. Also, in this same area, a dedicated fire suppression connection will be made to provide flow to the internal fire suppression system within the facility. The location of flow metering, backflow prevention, and valves controlling this flow will be coordinated with the design of the facility.

Domestic water requirements for the proposed jail facility are based upon the following assumptions:

Jail Capacity:

315 beds (present) / 700 beds (future) @ 120 gal/day/inmate
150 staff (present) / 300 staff (future) @ 50 gal/day/person

Average Daily Use:
Present:
315 inmates x 120 gal/day/inmate = 37,800 gallons per day
150 staff x 50 gal/day/person = 7,500 gallons per day
Average Daily Use = 45,300 gallons

Future:
700 inmates x 120 gal/day/inmate = 84,000 gallons per day
300 staff x 50 gal/day/person = 15,000 gallons per day
Average Daily Use = 99,000 gallons

These flow estimates will be confirmed/revised during the final design of the proposed facility and will be in accordance with City of Harrisonburg design criteria.

In addition to domestic water, additional water will be required for fire protection. Required fire flows for exterior fire hydrants will be based upon ISO Needed Fire Flow Calculations, are required by the City of Harrisonburg. These calculations will be completed during the final design process and will consider fire hydrant locations, interior fire zone delineation, and available flows/pressures. Fire hydrants will be served by the proposed 8" ductile iron water main, and the internal fire suppression system will be served by an independent/dedicated connection.

As part of this study, the City of Harrisonburg completed a Hydrant Flow Test for available flows from Hydrant 100/A, which will serve as the connection point for the water main extension serving the proposed facility. This study was performed on November 11, 2014 and found a static pressure of 106 psi, a static HGL of 1513, and a flow of 1,547 gpm with a residual pressure of 92 psi. Based upon this information, the City of Harrisonburg calculated an available flow of 4,123 gpm at a pressure of 20 psi. Based upon these results, it would appear that adequate water is available for this project.
Final coordination and sizing of all water improvements, as well as any coordination of fire compartment areas within the structure, will be part of the final design package for this facility and be subject to City of Harrisonburg review and approval.

WASTEWATER FACILITIES

Sanitary sewer from this facility will discharge into a collection system owned and maintained by the City of Harrisonburg. Once in the city system, sanitary flows are directed to the Harrisonburg - Rockingham Regional Sewer Authority facility located in Mt. Crawford, Virginia. While flows are directed to this facility for treatment, all billing and maintenance of the lines are performed by the City of Harrisonburg.

The proposed facility will be served by the extension of an 8" PVC sanitary sewer main which is located in Willow Springs Road, just southeast of the development parcel. Offsite extension of the proposed sanitary main will be required, but this extension will be within the limits of existing right-of-way for Willow Spring Road. No offsite easement acquisition is anticipated with this project.

Through discussions with the City of Harrisonburg, no capacity concerns/issues are anticipated with this project. Also, given the proposed elevations of the facility and infrastructure, no pumping of sanitary sewer flows is anticipated with this project.

ELECTRIC POWER

Electric Power will be provided by the Harrisonburg Electric Commission. There is an existing overhead 3-Phase power distribution line in Willow Spring Road and after discussions with the Harrisonburg Electric Commission, capacity exists to serve the proposed facility with a main extension into the site.
There is an existing switch gear at the intersection of Willow Spring Road and Pleasant Valley Road. In the event of a damaged line, or other power outage, there is the ability to serve this site from 2 directions, thereby limiting the possibility of complete power outage due to downed power lines caused by an accident, natural event, or human error.

Emergency Generators are planned for all necessary functions in the event of a total power outage to this area.

NATURAL GAS

Natural Gas exists in this area and is provided by Columbia Gas. An existing 4" Medium Pressure steal main exists in Willow Spring Road, with its existing termination being approximately 250' west of the anticipated entrance location for the proposed jail facility. Columbia Gas feels that adequate pressure/capacity exists in this main to serve the proposed facility, but final confirmation will be required once load calculations have been prepared and submitted to Columbia Gas. If this process confirms adequate pressure/capacity exists, the main will need to be extended to our property line; according to Columbia Gas during initial exploratory conversations, the cost for this extension will be the responsibility of the jail developer. Sizing of the service line into the facility will be determined upon the completion of the load calculations and submittal to Columbia Gas.

D. GEOTECHNICAL REPORT

A preliminary, limited geotechnical report is underway for the proposed site. It is not available for inclusion in the “First Draft” printing of this study.

E. SITE FEATURES IMPACTING DESIGN OR COST

The selected site has no known features that will pose a major cost impact to the project, however, significant costs are expected for site grading (cuts to fills) to address the grades on the site. Preliminary design has shown that a balanced site can be achieved, limiting the cost of importing borrowed material, while at the same time eliminating the need for both structural and non-structural retaining walls. It may also be possible, though partnership and early coordination with the County Landfill, who is in need of a borrow area for an upcoming expansion project, to have a majority of mass grading operations completed in advance of the project, thus eliminating their associated costs from that of this project. This possibility is being explored with the County in an ongoing fashion.

Other items that impact the final construction costs for this site include:

- Depending on final anticipated usage, Columbia Gas may waive a portion or all of the main extension fee to the site perimeter. Such determination will not be made until a formal application is provided to the utility server.
- The overall length of the access drives required to enter the facility. The overall lot configuration is the single largest feature causing the length of travel ways.
- The extension of both water and sanitary sewer mains to serve the site. While not excessive, the length of these mains will increase the cost of construction. Other, more direct, routes will be evaluated during the final design, but it is not anticipated that a more economical routing will be obtained.
- The requirement to meet the new Virginia Stormwater Regulations to provide water quality will increase the cost of this facility. During the final design of this project, the most economical solution to this effort will be sought.
- During the final design of the site, every effort will be made to create a layout and grading plan that does not impact the existing 12" ductile iron water main that bisects the site. If this becomes and issue and the water main has to be relocated, this will add to the final construction cost of the development.

SECTION V

Project Description

A. DESIGN RATIONALE
B. TYPE OF CONSTRUCTION
C. GROSS FLOOR AREA
D. BUILDING CODE CRITERIA
E. FINISHES
F. PROVISIONS FOR FUTURE EXPANSION
G. STRUCTURAL DESCRIPTION
H. PLUMBING/FIRE PROTECTION DESCRIPTION
I. HVAC DESCRIPTION
J. ELECTRICAL DESCRIPTION

V. PROJECT DESCRIPTION

A. DESIGN RATIONALE

The proposed Rockingham / Harrisonburg Regional Jail Annex will serve both the pretrial detainees and the sentenced population.

The following factors impacted the conceptual design decisions and functional layout of the facility and, collectively, dictated significantly to the design rationale. The Department of Corrections' *Standards for Planning, Design, Construction and Reimbursement of Local Correctional Facilities* was, of course, the dominant influence in the design rationale for security issues and the general incarceration environment.

1. The Owner's desire for a one story building for operational ease of inmate movement, proximity to outdoor recreation, and movement of deliveries throughout the building without elevators and staircases. Their history of operating a multi-story building informed this decision. The size and slope on the site suggest a long and linear building solution.
2. The specialized treatment options and inmate classifications planned in the annex building will require a variety of types, sizes and shapes of housing units. There will not be a typical cell shape repeated hundreds of times.
3. A space planning priority was the important adjacencies of the medical department having a direct connection with the intake department to create a special detoxification wing between the two departments. Also important is the medical department being in close proximity to the mental health housing for medical staff to move easily between offices and the housing unit.
4. The operational and security advantage of providing separate entrance points into the building for the following uses: public, staff, inmates, deliveries of food and supplies, maintenance, and a less secure "community custody" inmate entrance. This last entrance will enable processing for work release and work program inmates working outside the jail, and access to other potential community programs without being inside the secure perimeter of the jail.
5. Due to its size, the building will be separated by fire walls into separate "buildings", and emergency egress out of a building will be designed so that inmates can move from one side of a fire wall to another for the required area of refuge, without needing to be moved outside. However an outdoor, externally-fenced area of refuge yard will be created in the area designated for future expansion as an additional safety and security measure.
6. Creating a building design that can be expanded in separate directions if the need to provide more housing in the future is realized. The building is designed to easily expand general population housing in one location, mental health housing in a second location, and less secure "community custody" housing in a third location.

7. The parking is also separated by use, with a dedicated lot for staff, and separate lots for the public and community custody. It was desired that the community custody traffic is closest to the main entrance off Willow Springs Road, for easy access in and out.

B. TYPE OF CONSTRUCTION

A one story facility with some housing unit mezzanines is proposed. The primary building structure is planned as steel frame in combination with masonry load-bearing walls (interior and exterior) where appropriate. To create the secure enclosure required in the Virginia Department of Corrections' construction standards, the roof will have a concrete poured over steel roof deck. The floor will be minimum four inch concrete slab on grade. Further cost analysis is needed during the design phase to confirm the structural system. More detail on the structural system follows in Part G, "Structural Description," of this section.

There are no known aesthetic design criteria or architectural review board requirements that must be met. The exterior appearance of the jail expansion will be attractive and austere and will fit in the surrounding neighborhood of low rise industrial buildings. Low slope roofs are prominent in this neighborhood. Exterior materials are chosen to be functional and durable. Masonry cavity wall construction with a veneer of decorative concrete masonry units, metal panel, or brick are considered for the exterior walls. Exterior concrete masonry walls forming part of the jail's secure perimeter shall have an 8" minimum thickness, containing steel rebar and grouted solid per Department of Corrections standards. The primary roofing system will be a membrane system at ¼" slope per foot.

The interior walls will be of concrete masonry units (cmu), bearing and non-bearing types, except in administrative areas where gypsum wallboard on metal studs will be used. Interior security walls will contain steel rebar and will be grouted solid.

Ceilings will vary from exposed structure to perforated security steel, drywall, and lay-in acoustical panels. All ceilings in inmate accessible areas shall be primarily detention grade. Floor finishes will include exposed sealed concrete, VCT, quarry tile (Kitchen areas) and ceramic tile (in selected areas such as staff toilets, public toilets, etc.). All finishes will be selected for appropriateness for location, accessibility, and maintenance. Interior cmu walls and partitions will be filled and painted, using special coating systems where appropriate.

<u>Detention and Security Description</u>

Doors, frames, and windows in inmate areas will be steel, detention or architectural grades where appropriate. Hardware will be detention grade at secure doors and heavy-duty commercial hardware elsewhere. Security fasteners will be used on hardware where accessible to inmates. Doors, frames, and windows in the non-secure areas will be heavy-duty commercial grade products.

Glazing will be security-type polycarbonate in varying thicknesses as required for security. Fire-rated glass will be used where required by code. Tempered glass will be used elsewhere. Glazing will be laminated with tinted mylar film where one-way observation is desirable.

Security components will be an integrated system of lock control, cameras, CCTV, intercom and audio alert. Either pneumatic or electro-mechanical locking systems of maximum, medium, and minimum grades will be used where appropriate. A Central Master Control Room is positioned physically in the intersection of the two main corridors of the facility with windows affording direct lines-of-sight monitoring the movement in the corridors. This room will be the hub of the security system for the building. It shall utilize a touchscreen electronic control console to both remotely control and monitor the various security control devices (i.e., door locks, intercoms, CCTV cameras). This station will be staffed 24 hours per day, 7 days per week.

The addition of a card reader system is proposed for select doors. The goal is to take some of the load off Master Control while speeding up door operation, which will improve staff access and response time, especially in emergency situations. The card reader system is proposed to be integrated into the security control system.

Video visitation stations will be installed in each housing unit for the inmates, and adjacent to the public lobby for visitors. This system will allow the facility more flexibility with visiting hours and will increase staffing efficiency by decreasing the time staff are escorting inmates to visits.

A Vehicle Sallyport (VSP), technically outside the security perimeter, will nevertheless provide additional security for law enforcement and transport vehicles that are moving detainees in and out of the facility, and will provide protection from the weather by being covered. The coiling door of this Vehicle Sallyport should be interlocked with the building's security door entering the building.

The main design approach for all the various security/detention equipment is to provide a safe and secure facility for all of its users. This can be achieved through proper selections of individual products and minimizing quantities. The security solution is to aid the facility's staff in performing their jobs and not to hamper them.

All construction involving security and the built environment for incarceration facilities will be in accordance with the DOC *Standards* (1994 edition).

C. GROSS FLOOR AREA

The total gross floor area of the jail design presented in this study is 144,200 square feet. The 315 bed jail portion accounts for approximately 126,000 square feet and the rest is built-in future core space.

D. BUILDING CODE CRITERIA

1. Use Group: I-3, Condition IV, non-separated mixed use.

2. Occupant Load by Use:

   a. Jail Main Floor Level - Inmate and Staff area:
   100 gross square feet per occupant
   +/- 117,000 g.s.f. / 100 = 1,170 occupants
   b. Kitchen
   200 gross square feet per occupant:
   +/- 7,800 g.s.f. / 200 = 39 occupants
   c. Mechanical / Electrical /Large Storage Areas / Vehicle Sallyport
   300 gross square feet per occupant
   14,900 g.s.f. / 300 = 50 occupants
   d. Warehouse
   500 gross square feet per occupant
   4,500 g.s.f. / 500 = 9 occupants

   Total occupants for jail as calculated from Table 1004.1.2. of the International Building Code = +/- 1,268 occupants.

   The *design* occupant load may be less. It is calculated by adding the actual planned amount of occupants who will use the space, however, the code requires that when calculating *design* occupant load (actual intended occupants) and the occupant load calculated by areas from the table in the code, the greater of the two methods be used to calculate egress requirements.

3. Type of Construction: IIB

   Note: The concept design presented in this Study plans fire walls to separate the building into fire areas. The maximum fire area for the building as designed is 40,000 square feet. Three fire walls are planned.

4. Automatic Sprinkler System

5. Engineered Smoke Evacuation System

E. FINISHES

Preliminary finish selections are as follows:

SPACE	FLOOR	WALL	CEILING
Administration	VCT	Painted	Lay-in
Main Corridors	VCT	Painted	Lay-in*
Toilets (inmate)	Concrete	Painted	Security Drywall
Toilets (public/staff)	Ceramic Tile	Ceramic Tile/ Painted	Drywall (Security Drywall in Secure Perimeter)
Kitchen	Quarry Tile	Painted	Vinyl coated Lay-in*
Programs	VCT	Painted	Security Metal
Multi-purpose	VCT	Painted	Security Metal
Intake	VCT	Painted	Security Metal
Cells	Exposed	Painted	Maximum Security concrete or steel
Dormitories – Minimum Security	Exposed	Painted	Low Security Metal
Mech/Elec/Storage	Exposed	Painted	Exposed

VCT = Vinyl Composition tile

Drywall = Gypsum Wallboard

Security Drywall = Gypsum Wallboard with a layer of steel security mesh

Lay-in = Suspended lay-in acoustical panels – 2 x 4 or 2 x 2

Security Metal = Suspended perforated steel with acoustical batts or perforated steel planks for higher security areas

* Lay-in ceilings in inmate areas will be limited to areas under supervision and above 10’ in height. Impact clips will be used to hold acoustical panels in place.

F. PROVISIONS FOR FUTURE EXPANSION

The facility has been designed to allow for one or more future expansions of approximately 385 beds to bring the total capacity to 700. The number 700 represents 50% expansion on and above meeting the 15 year forecast (208 existing rated capacity at downtown jail + 467 = 675 fifteen year forecast. 50% of 467 = 233. 467 + 233 = 700).

The site development concept includes space for additional housing units to be added in three locations. While the core services (kitchen, laundry, medical, intake, visiting, and staff support) for 700 are built into the initial project design, there are some housing support spaces that would be added along with the future housing. These include the 10% "special housing" Department of Corrections' requirement and program/classroom/recreation space. The three planned expansion areas are located for three different housing types: space adjacent to general population housing, space adjacent to mental health housing, and space adjacent to community custody housing. Refer to the schematic site plan for a graphic illustration of the potential expansion areas.

The site has space for future parking to be added also.

G. STRUCTURAL DESCRIPTION

APPLICABLE CODES

- Virginia Uniform Statewide Building Code (VUSBC), 2012 Edition, Effective July 14, 2012 (International Building Code, 2012).
- Design Loads: ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
- Concrete: ACI 318-11 Building Code Requirements for Structural Concrete and ACI 318R-08 Commentary.
- Structural Steel: ANSI/AISC 360-10, Manual of Steel Construction, Fourteenth Edition.
- Masonry: TMS 402-11 / ACI 530-11 / ASCE 5-11 Building Code Requirements for Masonry Structures.
- Cold Formed Steel: AISI Standard – North American Specification for the Design of Cold Formed Structural Steel Members, Latest Edition.

FOUNDATION SYSTEM

Contingent upon the results of the final geotechnical investigation it is anticipated that the building will be supported on shallow spread footings designed to bear on original undisturbed soil or controlled compacted fill material.

ROOF FRAMING SYSTEM

Roof construction will consist of concrete slab on 1½" x 20 gage wide rib galvanized roof deck supported on open web steel joists. Roof joists will be supported on wide flange steel beams and steel columns. Roof joist framing will be supported on reinforced CMU bearing walls in areas of the building where steel column placement is impractical and bearing walls are readily available. Roof framing will be designed to support mechanical equipment in addition to applied dead, live, and snow loads.

FIRE WALLS

The construction type utilized for this building will not require the steel structure to be rated, but will require the building to be separated into four areas with three fire walls. The fire wall construction will be reinforced and grouted CMU designed as a freestanding cantilever wall.

GROUND FLOOR CONSTRUCTION: Reinforced concrete slab on grade.

LATERAL LOAD RESISTANCE

It is anticipated that the lateral load resisting system will consist primarily of reinforced CMU shear walls.

SPECIAL DESIGN FEATURES: None at this time.

DESIGN LOADS

Risk Category (IBC Table 1604.5): III

Live Loads:
Floor: 100 psf, typical
Roof: 30 psf, minimum

Snow Loads:

Ground Snow Load, P_g:	35 psf
Flat Roof Snow Load, P_f:	27 psf
Minimum Roof Snow Load, P_m:	22 psf
Importance Factor, I_S:	1.1
Thermal Factor, C_t:	1.0
Exposure Factor, C_e:	1.0

Wind Loads:

Ultimate Design Wind Speed (3 Second Gust):	120 MPH
Nominal Design Wind Speed (3 Second Gust):	90 MPH
Exposure Category:	B
Internal Pressure Coefficient (GCpi):	$\pm$ 0.18
Components & Cladding Wind Pressure:	Per IBC and ASCE 7

Seismic Loads:

Site Classification:	Contingent on final geotechnical report
Importance Factor, I_E:	1.25
Spectral Response Accel., Ss:	19% g
Spectral Response Accel., S_1:	6% g

STURCTURAL MATERIALS

Foundation Concrete:	3000 psi
Reinforcing Steel:	ASTM A 615, Grade 60, Fy=60ksi
Structural Steel:	
(Wide-Flange)	ASTM A 992, Fy=50ksi
(HSS)	ASTM A 500 Grade B, Fy=46ksi
Misc. Structural Steel:	ASTM A 36, Fy=36 ksi
Deck:	SDI, Fy=33 ksi
Light Gage Steel:	AISI S100 36 ksi and 50 ksi

H. PLUMBING AND FIRE PROTECTION DESCRIPTION

CODE REFERENCES

The proposed plumbing and fire protection systems were analyzed and recommendations made referencing design standards from the International Mechanical Code (2012), International Plumbing Code (2012), and NFPA.

PLUMBING – PROPOSED SYSTEMS

PLUMBING FIXTURES AND EQUIPMENT

Plumbing fixtures accessible to inmates shall be vandal resistant. It is recommended that penal fixtures employ electrically operated push buttons linked to Master Control and be coordinated with the security systems. Fixtures for staff use shall be standard commercial grade plumbing fixtures. Fixtures accessible to the physically handicapped shall be provided where required.

DOMESTIC WATER PIPING SYSTEM

A preliminary flow test has been conducted and the pressures appear adequate. A domestic water booster pump package will not be required but this will need to be confirmed during design.

A 6" domestic water service will be fed from the new 8" site water main connected to the existing 12" water main located on the southern bounds of the property. The domestic water service will enter the building at the Central Plant. A reduced pressure zone (RPZ) backflow preventer shall be installed in the domestic water service to prevent potential contamination of the public water supply.

The domestic hot water system shall consist of multiple gas fired water heaters. The water heaters shall be zoned to serve common areas and use types (ex. – Food Service, Laundry, and Holding Cells). This arrangement reduces the required pipe sizes and total length of domestic hot water piping.

The domestic hot water temperature for non-inmate areas shall be 120°F. Tempered water (90°F) shall be provided to inmates by blending the 120°F water with domestic cold water. Gas fired water heaters shall generate 140°F for use in the Food Service and Laundry areas.

Circulation pumps shall maintain the water temperature for each domestic hot water system. The temperature of each system will be monitored by the building automation system.

SANITARY PIPING SYSTEM

A 6" sanitary main shall serve each housing unit and the core of the building. The sanitary mains from each building section will join together outside the building and form a common sanitary main. The exterior sanitary main shall connect to the new extension of the existing 8" municipal sanitary main located on the southeast end of the property.

Piping systems for the proposed facility will be standard weight cast iron no-hub above floor and PVC below ground. Institutional waste fittings shall be installed at the combi-units, and floor drains shall also be installed in the Dayrooms.

The Kitchen shall be served by an independent drainage system. This system will be cast iron below the slab and shall lead to a grease interceptor prior to connecting to the primary sanitary system.

STORM WATER PIPING SYSTEM

The storm water piping system for the proposed facility will be designed to discharge by gravity to two storm water detention systems located on west portion of the property. Roof overflow will be accommodated by means of an independent safety overflow system discharging in readily visible locations.

NATURAL GAS

A natural gas line is currently located in Willow Spring Road as noted in Section IV of this report. This is depending on the utilization rate of the jail, some or all of the costs to extend the line could be waived by Columbia Gas.

Gas-fired equipment will likely consist of HVAC equipment, kitchen equipment, and clothes dryers.

FIRE PROTECTION

A preliminary flow test has been conducted and the pressures appear adequate. A fire pump will not be required but this will need to be confirmed during design.

A 6” sprinkler main shall feed off from the new 8” site water main. A double detector check valve shall prevent water from the sprinkler system from contaminating the public water supply. A hydraulically calculated wet type sprinkler system shall be designed in accordance with NFPA-13. Areas accessible to inmates will employ institutional style sprinkler heads. All other areas will have standard heads.

I. HVAC DESCRIPTION

CODE REFERENCES

The proposed HVAC systems were analyzed and recommendations made referencing design standards from the International Mechanical Code (2012), International Plumbing Code (2012), and NFPA.

AIR DISTRIBUTION SYSTEMS – PROPOSED SYSTEMS

Three HVAC systems were analyzed to assist in determining the most appropriate system for the Jail Annex. The systems are listed below:

a. System 1: Water Source Heat Pumps w/100% Outside Air Energy Recovery Unit

b. System 2: Air Handling Units with Electric Heating and Chilled Water Cooling

c. System 3: Air Handling Units with Hot Water Heating and Chilled Water Cooling

All of the systems analyzed provide the benefit of the equipment being located outside of the secure areas. The majority of the equipment requiring maintenance could be easily serviced on the ground, roof, or mechanical rooms. Although a water source heat pump system and an electric heating system have lower installation costs compared to a central boiler/chiller plant system, the latter was chosen to be the most suitable system for this project. The central boiler/chiller plant system was chosen for the following reasons:

- Lowest life cycle cost
- Most energy efficient
- The compressors associated with water source heat pumps require more maintenance compared to the smaller number of compressors associated with a centralized chiller plant.
- Long service life

HEATING SYSTEM

A central boiler plant utilizing multiple, natural gas-fired, modular condensing boilers in the Central Plant is recommended. The use of modular boilers provides increased efficiency at partial load and provides redundancy.

It is recommended that four (3) 1,000 MBH boilers be provided to serve the base building. This quantity of boilers provides a level of redundancy so that if one boiler fails, the remaining boilers can satisfy 85% of the full load of the building. Space will be reserved for two future 1,000 MBH boilers to handle the increased heating demands of the proposed future addition.

The boilers shall generate 140°F water, and the return water temperature shall be 100°F. This temperature differential increases boiler efficiency, reduces pump gpm, and reduces the required size of installed piping when compared to a traditional heating hot water distribution system. Pipe main sizes will take into account the proposed future expansions. The pipe mains shall also be valved and capped to facilitate extension of the heating hot water service.

The heating hot water distribution system will operate as a variable-primary system. Three (3) variable speed pumps (two operating in parallel and one backup) will circulate water through the heating hot water loop. The use of variable speed pumps reduces energy consumption and provides proper temperature control. A bypass may be required for this system if the selected boilers have minimum flow requirements.

CHILLED WATER DISTRIBUTION SYSTEM

Installation of (2) 200 ton air-cooled chillers in a mechanical yard adjacent to the Central Plant is recommended. The chillers shall be equipped with multiple compressors, which provide a degree of redundancy. The chillers shall be staged to ensure maximum loading and to provide optimal energy efficiency. Space will be reserved for a third 200 ton chiller to handle the increased cooling demands of the proposed future additions. Air-cooled chillers are a better choice than water-cooled chillers for this project because they require less maintenance, and the annual energy costs are comparable.

The chillers will generate 42°F water, and the return water temperature will be 56°F. This temperature differential increases chiller efficiency, reduces pump gpm, and reduces the required size of installed piping when compared to a traditional chilled water distribution system.

The chilled water distribution system will be operated as a variable-primary system. Three (3) variable speed pumps (two operating in parallel and one backup) will circulate water through the chilled water loop. The use of variable speed pumps reduces energy consumption and provides proper temperature control. A bypass shall be provided to ensure a minimum flow rate through the chillers.

Chiller sizes shall be confirmed during design.

AIR HANDLING UNITS

Areas occupied by inmates shall be served by energy recovery units with hot water heating and chilled water coils. These units shall be located on the roof of the area that they serve. Energy recovery units are recommended because these areas require high percentages of ventilation air and exhaust air. Air that normally is exhausted can be used to preheat/precool ventilation air for these spaces, reducing energy consumption. The Housing areas will be zoned based on common exterior exposures and use type (holding cells, dayrooms, indoor recreation).

Multiple VAV air handling units will serve other areas of the building such as Administration, Intake, and Medical. These units will also be equipped with hot water heating and chilled water coils. Terminal units will be equipped with hot water reheat coils to control temperature and humidity levels for the spaces they serve. Depending on the application, energy recovery may or may not be used. For example, energy recovery is typically not used in medical areas due to concerns of cross-contamination between the exhaust and ventilation air streams.

Numerous rooftop exhaust fans will exhaust air from bathrooms, janitor closets, electrical rooms, and similar areas. Exhaust fans will also serve various kitchen functions such as kitchen hood and dishwasher exhaust.

SMOKE MANAGEMENT SYSTEM

A smoke management system will be provided to maintain pressure differentials and exhaust smoke where required by code in secure areas. The strategy used will include a series of exhaust and supply fans along with smoke dampers to provide a negative pressure in the space where smoke is detected and to provide a minimum of 24 air changes per hour. Other spaces will be positively pressurized to prevent migration of smoke into a smoke free space. Corridors and egress elements will be pressurized with outside air to reduce the possibility of smoke entering egress elements. Dampers involved in the smoke management strategy will be UL listed smoke dampers and will be selected to fail in their smoke management position. Smoke management control sequences will be exclusively controlled by the Fire Alarm System.

BUILDING AUTOMATION SYSTEM

A web-based direct digital control (DDC) building automation system (BAS) is recommended for the new facility. The system allows for control strategies that optimize performance and reduce energy costs of the various HVAC systems. A web-based BAS also allows for external monitoring as well as integration with the security and fire alarm systems.

J. ELECTRICAL DESCRIPTION

GENERAL PROVISIONS

The electrical portion of the work will consist of providing building normal and emergency power, lighting, fire alarm system, lightning protection system and communication raceways and boxes for the facility.

All electrical work will be in compliance with all applicable federal, state and local laws and regulations governing standards of design, construction, workmanship and material, as well as VDOC standards for local jails and lockups. The electrical work will be in compliance with the latest adopted version of the National Electrical Code (NEC).

ELECTRICAL SERVICE

Primary power will be distributed from the utility company underground line via a ductbank. This will be routed to padmounted transformers located adjacent to the building. Primary work will be by the utility company. The transformers will be padmounted and will supply secondary power to a main electrical room located in the building. Secondary services to the building will be 480/277 volt, three phase, four wire via underground ductbanks.

The load for the building will depend upon whether gas can be provided for the building. The facility will be 144,200 square feet expandable to 230,140 square feet in the future. With gas heat, the building load will be approximately 15-16 watts per square foot. With electric heat, the building load will be about 21-22 watts per square foot. The following will be the service sizes depending upon the heating system.

Gas Heat	3,682 KW	4,430 Amps	Two Services
Electric Heat	5,063 KW	6,092 Amps	Two Services

The actual service size will depend upon the demand calculations for the facility. For gas heat, it is likely the services will be 4000A and 1600A. For the electric heat, the services would likely be 4000A and 3000A. These services would all be at 277/480 volts, but a second service at 120/208 volts may be considered (this would reduce the amount of dry type transformers in the building, but would increase the switchboard ampacity).

The service voltage (277/480V) will be used to power major equipment such as HVAC equipment, kitchen equipment, water heaters (if electric), motor loads above ½ hp and lighting. The Main Distribution Switchboards will distribute power from the incoming service to smaller electrical rooms located throughout the building.

ELECTRICAL DISTRIBUTION

Two new main switchboards, rated as indicated above, will be located in the main electrical room. The main service disconnect devices will be power type circuit breakers. The feeder circuit breakers will be group mounted molded case circuit breakers. Owner meters will be provided to monitor building load and energy usage. Ground fault protection will be provided at the main circuit breakers. Surge protection will also be provided at the main switchboards. There will be a new emergency switchboard fed by a transfer switch. New motor control centers (normal and emergency) will be provided for air handlers, fans and pumps for the heating system. The motor control centers will be located in the mechanical room(s). The cooling/heating system may not be on emergency power.

A new main electrical room will be required. This room will require approximately 800 square feet and must have a door at each end per the National Electrical Code. Smaller electrical rooms will be required throughout the building for local distribution. These rooms will be required to be about 80 square feet each.

Power will be distributed from the main electrical room at 277/480 volts to panelboards located in various areas of the building. Power for receptacles, appliances, inmate cell lighting and other devices will be provided at 120/208 volts, three phase, four wire via dry type transformers. Large mechanical loads, such as chillers, will be fed directly from the main switchboard. Other mechanical loads will be fed from local panels. Adjustable frequency drives will be furnished for select mechanical equipment as will be indicated in the HVAC documents.

Power and lighting circuits serving inmate accessible areas shall be routed through relay panels to allow low-voltage remote control of these circuits by the security electronics system, either automatically by program or manually using the Correctional Officer's touch screens.

Motors 1/2 hp and lower will be supplied by 120V circuits. Motors above 1/2 hp will have individual 480V circuits. Motors will be the high efficiency type. Motors supplied by adjustable drives will be fabricated with cast iron frames.

STANDBY POWER GENERATOR SYSTEM

Emergency power will be supplied by a new emergency diesel generator, approximately 750 KW, located outdoors in the mechanical equipment yard. The new emergency switchboard is estimated to be 1200 amps, 277/480 volts. This emergency electrical equipment will be housed in a separate room from the normal power electrical equipment.

The generator will have a sub-base fuel tank with a storage capacity for a minimum of 48 hours runtime. The generator will be housed in a weatherproof, sound attenuated enclosure. A platform may be required around the generator if the sub-base fuel tank height is 30" or more.

The generator shall carry the following life safety (NEC 700) loads via a dedicated automatic transfer switch and distribution system: emergency egress lighting, security control system, fire alarm notification system and other loads deemed life safety by the authority having jurisdiction (AHJ).

The generator shall carry the following legally required (NEC 701) loads via a dedicated automatic transfer switch and distribution system: smoke control system and other loads deemed as legally required standby systems by the authority having jurisdiction (AHJ).

The generator shall carry the following optional standby (NEC 702) loads via a dedicated automatic transfer switch and distribution system: refrigeration equipment, designated power outlets, dedicated air conditioning systems serving network and security equipment spaces and other loads deemed necessary by the owner and AHJ. General heating and air conditioning for the entire facility is not included in the generator load.

All new automatic transfer switches will have a bypass isolation switch. If a fire pump is deemed to be necessary, then it will be fed from a dedicated breaker at the generator. The generator load size above does not include a fire pump.

UNINTERRUPTABLE POWER SUPPLY SYSTEM (UPS)

An uninterruptable power supply (UPS) system shall be provided for the security electronics power systems. These systems include the door locking system, CCTV system and security computer and control systems.

For loads other than the security system, including telephone and computer network equipment, the owner will provide their own local UPS systems as required.

ELECTRICAL SITE WORK

The electrical site work will consist of the trenching and backfilling required for underground distribution. The underground distribution will consist of Schedule 40 PVC conduits in a concrete ductbank. These will run from the service connection at the main switchboards to the utility transformers on the site. The utility transformers will be provided with a concrete base.

The underground communication conduit system shall consist of a ductbank of schedule 40 polyvinyl chloride (PVC) conduits embedded in concrete, from the property line to the communications MDF room. The ductbank shall contain sufficient conduits for incoming telephone, internet, and cable television services. If cable television is not available at the site, provisions will be made for satellite television dishes on the roof.

LIGHTING

The lighting design will be in accordance with recommendations of the Illuminating Engineering Society of North America and VDOC standards for detention centers.

Lighting fixtures will primarily be LED fixtures. Other lamp types will be considered for specialty areas. LED fixtures have lamps rated at a minimum of 50,000 hours life.

Local switches for the control of lighting shall be provided to serve individual spaces, except inmate areas which will be controlled through the security system via relays operated by a touch screen panel. Certain areas, such as conference rooms and offices, will be provided with occupancy sensors to turn of the lighting in the spaces when they are unoccupied. Fixtures mounted in suspended ceilings in maximum and medium security housing units shall be supported from the structure with threaded rods.

Types and grades of fixtures for specific areas will be as follows:

a. Offices and Corridors (non-inmate areas): Recessed LED fixtures. Fixtures will be the recessed indirect type. Lighting levels shall be 50 FC in the offices and 20-30 FC in the corridors.
b. Offices and corridors (inmate areas): Surface and recessed LED vandal-resistant polycarbonate lens fixtures. Lighting levels shall be 50 FC in the offices and 20-30 FC in the corridors.
c. Cells: Wall or ceiling mounted LED maximum-security type fixtures. Lighting levels shall be 20 FC minimum at inmate desk and grooming areas with an average level of 6 FC in the cell. Each cell will have a night light which will be on emergency power (life safety branch). There will be controls to turn off lights in the inmate areas from the control room.
d. Mechanical, Electrical, Storage and other Utility Areas: Wraparound type LED fixtures either surface or pendant mounted. Lighting levels shall be 30 FC.
e. Exterior and Site Lighting: LED wall and pole mounted outdoor fixtures that meet the requirements for “Dark Skies” compliance. The fixtures will be the cutoff type to prevent spill light and has a cutoff angle about 15 degrees below the horizontal. Site lighting will be controlled by the security system and photocells via lighting contactors or relays. Staff and visitor parking areas will be designed to provide an average light level of one (1) footcandles with a minimum of two-tenths (0.2) footcandles. Lighting levels to one-tenth (0.1) footcandles at the property line
f. Exterior Lighting-Inmate Areas: These fixtures will be LED. Lighting levels shall be 3 FC average with a minimum of 0.5 FC.
g. Egress Paths: Lighting levels will be 1 FC average with a minimum level of 0.1 FC. The lighting uniformity (maximum to minimum) shall not exceed 40:1.
h. Exit Signs: These fixtures shall be the LED type, single or double face as required. They will be vandal resistant in inmate areas.

All emergency lighting shall be powered by the normal and life safety power systems. The life safety system will energize in less than 10 seconds in the event of an outage. Battery packs or inverters will be provided in areas which require instant on lighting in the event of an outage on the normal system (where inmates and correctional staff may be in the same area).

DEVICES, CONDUITS AND CONDUCTORS

All devices such as light switches and receptacles shall have a minimum rating of 20 amps, 120 volt for receptacles and 277 volt for switches. Device covers shall be security grade in inmate accessible areas where such protection is deemed necessary, and shall be constructed of stainless steel or plastic in other areas. Outdoor devices will be provided with cast metal weatherproof “in-use” covers.

Conduits shall be used for all systems 24 volts and higher. Minimum trade size conduit allowed shall be ¾”. All conduits shall be concealed where possible. The classification of conduit usage allowed shall be as follows:

a. Underground/Under Floor Slab: PVC Schedule 40.
b. Parking/Roadway, Heavy Traffic: PVC Schedule 80.
c. Outside the Secure Perimeter: Electrical Metallic Tubing, Steel Fittings.
d. Inside Secure Perimeter/Accessible Exposed Conduit: Rigid Steel.

Conduit shall run exposed in mechanical equipment and utility spaces. In all other spaces, it shall be concealed above ceilings, in shafts and in furred spaces. Flexible connections to light fixtures, devices and equipment within the secure perimeter may utilize liquidtight flexible conduit with a maximum length of four feet.

All screws and fasteners in electrical systems within the security perimeter shall be tamper resistant security screw type, requiring a special tool.

Branch circuit wiring for power and lighting shall generally be type THHN/THWN. All conductors No. 10 AWG and smaller shall be solid copper. All conductors No. 8 and larger shall be stranded copper. All power conductors shall be insulated for 600 volts.

FIRE ALARM SYSTEM

The fire alarm system will be fully addressable complying with the NFPA 72 and local codes. The activation of a manual or automatic device will initiate audible and visual indicating functions. The system will include fire alarm programmed dry contacts or signals for security electronics and building automation system monitoring of the fire alarm system status. Fire alarm system device wiring will be UL-listed multi-conductor cable fire alarm cable run in a “daisy chain” to each device via conduit. Conduits will be kept separate from building power wiring and other systems such as telephone, building automation system (BAS), and data cabling.

Manual pull stations, smoke, heat and duct detectors, alarm horns and visual devices will be located at all required locations to provide full coverage of the facility. Horns and strobes will be located to provide the code required visual (flash rate and intensity) and audibility requirements. Duct detectors will also be provided in all return ducts for all air handling units greater than 2000 CFM. Smoke detectors and indicating devices shall be mounted as high as possible and be covered with heavy gauge wire mesh cages securely fastened to the surface if mounted lower than 12 feet above the floor in secure areas.

The system will interface with sprinkler flow and tamper valve switches and any other sprinkler components in the building, respectively. Fire protection systems are as identified as follows:

- NFPA 14 Standpipe system with area sprinkler protection.
- Wet-pipe building-wide NFPA 13 sprinkler system with dry-pipe pre-action systems.
- Pump controllers (if pump required).

TELEPHONE, DATA AND CABLE TELEVISION SYSTEMS

The MDF/Entrance Facility will serve as a demarcation room and main distribution room for the building. The room will be provided with plywood backboards. All rooms and closets will have adequate space, ventilation, and cooling and active networking equipment in standard 22 inch racks provided by the owner. Conduit(s) will be provided to tie to the existing phase 1 data closet. These conduits will connect new and existing telecommunication systems as well as cable television and fiber backbone cables.

IDF rooms will be located throughout the facility and would require approximately 80 square feet of space each. IDF rooms will be equipped with two dedicated quad electrical circuits (120V 20A) installed. In addition, duplex receptacles will be provided at 4 foot intervals along the length of the four walls at 18” above the finish floor. Walls will be provided with plywood backboards as required.

Data and telephone boxes will be located throughout the facility. The outlet boxes will have conduit back to the nearest telephone data closet. Locations of outlets will be coordinated with the owner.

Cable television (TV) outlets will be provided to serve television outlets in inmate dayrooms and other spaces as required by the owner. Coax cable will be run from the TV outlets to the nearest communication closet. This cable system will tie to the existing television system in Phase I.

LIGHTNING PROTECTION SYSTEM

A lightning protection system will be provided. Down conductors will be provided along with new ground rods and ground loop. The entire system will be UL Master labeled. A NFPA 780 assessment will be done to determine the lightning risk to the facility.

SECTION VI

Annual Heating/Cooling Cost and Energy Analysis

A. SUMMARY

B. ANNUAL OPERATING COST

C. MAINTENANCE BUDGET FORECAST

VI. ANNUAL HEATING/COOLING COST AND ENERGY ANALYSIS

A. SUMMARY

Three basic types of HVAC systems were studied for this project along with multiple fuel types for the chosen HVAC system. The systems and fuel types studied are summarized below.

1. Water Source Heat Pumps with 100% Outside Air Energy Recovery Unit

2. Air Handling Units with Electric Heating and Chilled Water Cooling

3. Air Handling Units with Hot Water Heating and Chilled Water Cooling

System 1 – Water Source Heat Pumps

A water source heat pump (WSHP) system was one of the systems analyzed to be used for the proposed facility. Although it has an attractive installed first cost and is reasonable energy efficient, it was evaluated to be a poor system choice for the following reasons:

- Many water source heat pumps would have to be located in secure areas. This makes routine maintenance such as filter replacement more cumbersome.

- The compressors associated with water source heat pumps require more maintenance compared to the smaller number of compressors associated with a centralized chiller plant. Overall, water source heat pumps are not as robust compared to a central boiler/chiller plant.

- Noise from compressors may be a concern in certain areas of the building.

System 2 – Air Handling Units with Electric Heating and Chilled Water Cooling

System 2 is an all-electric system and offers many advantages. It has the lowest first cost, simplest maintenance requirements, and a reasonable service life. However, due to the prevailing electric rate for the facility, it is the least cost effective option for heating and cooling the building. For that reason, System 2 is not recommended.

System 3 – Air Handling Units with Hot Water Heating and Chilled Water
This option is the most energy efficient and has the highest first installed cost of the three systems evaluated. This system provides the following additional benefits:

- Lowest life cycle cost of the three systems analyzed.
- It has the longest service life of the three systems analyzed.
- The majority of the equipment requiring maintenance can be easily serviced on the ground, roof, or in the mechanical rooms.

However, it also has the following drawbacks:

- This system has the highest installed cost.
- This system has greater maintenance requirements compared to System 2.

Even though System 3 has the highest installed first cost, the benefits of the high energy efficiency and long service life of the system make this system the best choice for the facility.

B. ANNUAL OPERATING COSTS

The annual operating costs for the base building with a central boiler/chiller plant serving rooftop energy recovery units are summarized below.

Electricity:	$	99,930
Natural Gas:	$	58,690
Total:	$	158,620
$/SF:	$	1.1

C. MAINTENANCE BUDGET FORECAST

The annual budget for maintenance and repair of HVAC equipment for facilities of this type and size is estimated to be $140,000/year. Items in the budget include replacement of filters and belts, lubrication, and replacement of worn out parts. It is assumed that the annual operating budget for maintenance will increase by 2% every year. A forecast of the six-year operating budget for the facility is summarized below.

Year	Maintenance Budget
2020	$140,000
2020	$142,800
2020	$145,656
2020	$148,569
2020	$151,540
2020	$154,571

SECTION VII
Schematic Drawings

A. SITE PLAN – C1.0

B. OVERALL FIRST FLOOR PLAN – A2.0

C. FLOOR PLAN - PART A – A2.1

D. FLOOR PLAN – PART B – A2.2

E. FLOOR PLAN – PART C – A2.3

F. FLOOR PLAN – PART D – A2.4

G. EXTERIOR ELEVATIONS AND SECTION A4.0

A. SITE PLAN – C1.0

B. OVERALL FLOOR PLAN – A2.0

C. FLOOR PLAN – PART A – A2.1

D. FLOOR PLAN – PART B – A2.2

E. FLOOR PLAN – PART C – A2.3

F. FLOOR PLAN – PART D – A2.4

G. EXTERIOR ELEVATIONS AND SECTION – A4.0

SECTION VIII
Staffing Analysis and Operating Budget

A. STAFFING ANALYSIS

B. OPERATING BUDGET

VIII. STAFFING ANALYSIS AND OPERATING BUDGET

This section of the study contains staffing analyses and a six-year operating budget for the new Rockingham-Harrisonburg Regional Jail Annex facility. With a rated capacity of 315 beds, the new facility will occupy a single level and is being planned and designed as a full service, mixed direct/indirect supervision jail that will operate under the direction of a Regional Jail Board.

The proposed Regional Jail Annex is planned, designed, constructed and operated in accordance with the *Standards for Planning, Design, Construction and Reimbursement of Local Correctional Facilities* (VR 230-30-005.2) adopted by the Virginia Board of Corrections effective July 1, 1994. The operational, design and construction standards that are applicable to the project are defined in Part V of the *Standards*. Part V is entitled "Secure Detention Facilities Design and Construction".

A. STAFFING ANALYSIS

Staffing the stand-alone Regional Jail facility will require the following positions by function.

Central Administration

- Facility Administrator – Responsible for all operations of the 315 bed facility, including security, financial and administrative functions.
- Administrative Assistant – clerical functions for administration.
- Records Clerk – maintain inmate records.
- Classification Officer – Responsible for all classification activities at the facility
- Training Officer – Coordinates with the main HR and training office
- Information Technology Programmer – Oversee IT operations (existing staff)

Command Staff

- Facility Administrator - chief security and administrative officer 40 hour/week post.
- Program Lieutenant – Inmate Services/Programs – responsibility for all programs and services and coordination of volunteer programs, and is a 40 hour/week post
- Security Lieutenant – Security/Training - responsibility for security activities and training and is a 40 hour/week post
- Shift Sergeant - responsibility for security activities during the shift. Staffing plan provides for a Sergeant on each shift - 24 hours/day - 7 days/week post.

Security

- Master Control - 24 hours/day 7 days/week post - controls movement into/out of facility, movement between housing clusters.

- Control Room A - Housing cluster for males and females in the Mental Health housing areas, as well as special housing - 24 hours/day 7 days/week – controls movement into/out of cluster and monitors activity within the units.
- Control Room B – Housing cluster for mixed security celled housing area – 24 hours/day 7 days/week – controls movement into/out of housing area and monitors activity.
- Direct Supervision Officers – male and female minimum security dormitory areas.
- Rovers (Housing and Support) - 24 hours/day 7 days/week - supervise movement of inmates to programs, recreation, visiting, monitors food service and laundry areas, provides coverage of support areas and monitors activities in housing units, program and recreation areas.
- Booking/Release - 24 hours/day 7 days/week - controls movement into/out of vehicular sallyport, movement from sallyport into facility, responsible for the booking process and for controlling all intake/release cell doors.

Support

- Food Services Supervisor – 40 hour/week - supervise food service area, prepare monthly meal plan, and order food and kitchen supplies.
- Food Service Workers (Cooks) - assist in preparation of meals.
- Maintenance Supervisor – schedule routine maintenance and supervise preventive maintenance activities; directs maintenance technicians.

Medical

- Nurse Supervisor - 40 hour/week post, with medical, mental health and staff supervision responsibilities.
- RN/LPN/EMT - responsible for medical duties including coordination with doctor and dentist, daily medical call, control of medications, and distribution of medications.

Programs

- Community Custody Supervisor – coordinates and supervises work release, educational release, work force and other community custody programs and services.
- Volunteer Coordinator – 40 hour/week -coordinates all volunteer programs and services.
- Librarian - 40 hour/week - responsible for assisting in education program and maintains library services.

- Work Release/Work Force/Community Custody Officer - with program, community corrections and supervision responsibilities.
- Counselor – responsible for program delivery and coordination as well as implementing services in the mental health field.

Staffing Requirements – 315 Bed Expansion

The staffing for the expanded 315 bed expanded regional jail is summarized in the table on the following page. The posts/positions are listed by shift and the "relief factor" is applied to determine the number of full-time employees required. The derivation of the relief factor is described following the staffing table. For the Regional Jail facility (operating capacity of 315 beds), a staffing level of 124 employees will be required – consisting of 105 security and 19 non-security positions. Planned staffing for the new facility requires the creation of new additional positions and the utilization of existing personnel.

Relief Factor Derivation - A *post* defines a place/function that must be constantly manned for a specified time period. For some positions, constant coverage for a specified time period is not required. However for security posts, the "inmate supervision tasks" requires manning the post for a specified time period such as 24 hours per day, 365 days per year. An example of a post that would normally require coverage for 24 hours per day, 365 days per year is a control room post.

An officer has approximately 2,080 paid hours per year; however, the officer is not available for work assignments for the total 2,080 hours. The officer will not be available for assignment to a security post when on leave (vacation, sick and holidays) and when in mandated training (both off-site and on-site). To compensate for the time not available for assignment to a post, a relief factor is applied to the "post" to determine the number of officers required to "fully staff" the post. The relief factor for a 12 hour post is 1.25, which results in the requirement for 5 FTE positions for a single 24 hour/7 days a week security post. Positions requiring coverage for a 40 hour work week do not require a relief factor. The "1.25" relief factor is applied to the number of 24/7 posts to determine the manpower required to staff the post.

The Rockingham-Harrisonburg Regional Jail will utilize a 12-hour shift for most of the security posts, and a standard 8-hour shift for those administrative and support posts that are not primarily security posts.

Rockingham-Harrisonburg Regional Jail
Staffing For 315 Bed Facility

Function	Title	Security? yes	Security? no	40 Hr. Week	Shift A Day	Shift A Night	Shift B Day	Shift B Night	Total	Relief Factor	FTE
Administration	Facility Administrator	✓		1					1	1.00	1
	Administrative Assistant		✓	1					1	1.00	1
	Record Clerks		✓	3					3	1.00	3
	Classification Officer	✓		2					2	1.00	2
	Training/HR Officer	✓		1					1	1.00	1
	Security Lt	✓		1					1	1.00	1
	Program Lt	✓		1					1	1.00	1
	Subtotal			10	0	0	0	0	10		10
Security	Shift Sergeant	✓			1	1	1	1	4	1.25	5
	Master Control	✓			1	1	1	1	4	1.25	5
	Control Room #1	✓			1	1	1	1	4	1.25	5
	Control Room #2	✓			1	1	1	1	4	1.25	5
	Dorm Housing Unit Officer	✓			4	4	4	4	16	1.25	20
	Comm. Custody Housing Unit Officer	✓				1		1	2	1.25	2.5
	Rover/Relief	✓			4	4	4	4	16	1.25	20
	Intake Officer	✓			3	3	3	3	12	1.25	15
	Subtotal			0	15	16	15	16	62		77.5
Support	Food Service										
	Food Service Supervisor		✓	1					1	1.00	1
	Food Production Workers		✓		1	1	1	1	4	1.25	5
	Warehouse Officer	✓			1	1	1	1	4	1.00	4
	Maintenance Supervisor	✓		1					1	1.00	1
	Maintenance Technician	✓			1		1		2	1.25	2.5
	Subtotal			2	0	0	0	0	12		13.5
Medical/MH	Medical Services/MH										
	MH Nurse Supervisor		✓	1	0	0	0	0	1	1.00	1
	MH Counselor		✓	3	0	0	0	0	3	1.00	3
	RN/LPN/EMT		✓		1	1	1	1	4	1.25	5
	Subtotal			4	1	1	1	1	8		9
Programs	Volunteer Programs Coordinator		✓	1					1	1.00	1
	Librarian		✓	1					1	1.00	1
	Recreation Officer	✓		1					1	1.00	1
	Community Custody Supervisor (Sgt.)	✓		1					1	1.00	1
	Community Custody Officer	✓			2		2		4	1.25	5
	Work Force Officer	✓			2		2		4	1.25	5
	Subtotal			4	4	0	4	0	12		14
Total Security											105
Total Non-security											19
Grand Total				20	20	17	20	17	104		124

Staffing – Salary and Benefit Costs

The table that follows displays positions required to staff the new 315 bed facility and associated estimated salaries. All salaries are approximately FY-14 salaries based on known salaries for the positions in surrounding localities and benefits are assumed to 30% of estimated salaries to include FICA, VRS, Life, and Health.

This table identifies each position and the number of FTEs required (as identified in the staffing configuration table previously), estimated salary, and the total salary associated with each position. All salaries are expressed in FY-14 dollars.

Rockingham-Harrisonburg Regional Jail Facility -Personnel Services in FY-14 Dollars

Position	Salary	FTE	Salary Total
Facility Administrator	$76,300	1	$76,300
Administrative Assistant	$30,690	1	$30,690
Records Clerk	$30,690	3	$92,070
Training Officer	$43,100	1	$43,100
Classification Officer	$36,000	2	$72,000
Lieutenant	$55,000	2	$110,000
Shift Supervisor (Sgt.)	$43,100	5	$215,500
Master Control	$33,000	5	$165,000
Pod Control-Housing	$33,000	32.5	$1,072,500
Intake/Receiving	$33,000	15	$495,000
Rovers/Relief	$33,000	20	$660,000
Food Service Supervisor	$50,000	1	$50,000
Food Service Worker	$24,000	5	$120,000
Warehouse Officer	$33,000	4	$132,000
Maintenance Supervisor	$43,100	1	$43,100
Maintenance Technician	$33,000	2.5	$82,500
Nurse Supervisor	$55,000	1	$55,000
LPN	$40,000	5	$200,000
Mental Health Counselor	$40,000	3	$120,000
Recreation Officer	$33,000	1	$33,000
Volunteer Coordinator	$34,000	1	$34,000
Librarian	$30,690	1	$30,690
WR/CC Supervisor	$43,100	1	$43,100
WR/WF/CC Officers	$33,000	10	$330,000
Subtotal		124	$4,305,550
Benefits @ .30			$1,291,665
Total Personnel Services			$5,597,215

B. OPERATING BUDGET

A six-year operating budget, commencing in FY-21, for the 315 bed jail facility is presented in this section of the Planning Study. The table that follows displays the projected six year operating budget for the new staffing configuration based on the assumption that the facility is operating with a full complement of staff beginning in FY-21. The assumptions upon which the budget figures are based are presented after the table.

Rockingham-Harrisonburg Six Year Operating Budget: 315 Bed Expansion Only

Budget Category	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026
Personnel Services	$6,884,422	$7,090,955	$7,303,683	$7,522,794	$7,748,477	$7,980,932
Food Services	$510,262	$523,018	$536,094	$549,496	$563,234	$577,314
Health Services	$775,205	$794,586	$814,450	$834,812	$855,682	$877,074
Inmate Programs	$21,027	$21,553	$22,092	$22,644	$23,210	$23,790
Transportation	$64,484	$66,096	$67,748	$69,442	$71,178	$72,957
Direct Jail Support	$981,273	$1,005,805	$1,030,950	$1,056,723	$1,083,142	$1,110,220
Operating Capital	$165,415	$169,550	$173,789	$178,133	$182,587	$187,151
Other Indirect	$581,755	$596,298	$611,206	$626,486	$642,148	$658,202
Contingency	$154,971	$158,845	$162,816	$166,887	$171,059	$175,335
Total	$10,138,813	$10,426,705	$10,722,828	$11,027,417	$11,340,716	$11,662,977

Note: All budget categories except personnel services are based on reported inmate per day costs provided by the Virginia Compensation Board based on data provided by the Sheriff's Department; no assumption is made about the funding sources for the budget categories (the State typically funds most of the Personnel Services category).

A description for each of the budget categories is provided below along with a description of the estimating methodology.

Personnel Services (salary and benefit costs, and assumptions) were presented in previous tables. In each table, assumed salaries were calculated for each position to reflect FY-14 personnel costs. Costs were adjusted by 3% per year beginning in FY-15 to reflect FY-21 through FY-26 dollars for the proposed staffing levels.

Food Services reflects all direct non-payroll expenses related to providing food for the detainees and was estimated at $6.64 per inmate/day for FY-13 (the food services cost per inmate/day cost in FY-13 for the Rockingham-Harrisonburg Regional Jail according to the FY-13 Compensation Board Cost Report). Estimated costs were adjusted by 2.5% per year beginning in FY-14.

Health Services reflects all non-payroll expenses related to providing medical services to the inmates, and was estimated at $5.53 per inmate day for FY-13 – the reported FY-13 health cost for the Rockingham-Harrisonburg Regional Jail. Health care costs for all regional jails statewide were $7.35 per inmate day in FY-13. FY-13 costs were adjusted annually by 2.5% annually through FY-26.

Inmate Programs reflects all non-payroll expenses to provide programs such as general education, substance abuse and other counseling, recreation, etc., and was estimated at

$0.15 per inmate/day for FY-13, adjusted by 2.5% annually. The Rockingham-Harrisonburg Regional Jail reported $0.0 costs in FY-13. The base used in the analysis represents the average inmate per/day cost for Virginia Regional Jails in FY-13.

Transportation reflects all vehicle expenses including replacement, purchase, maintenance, repairs, fuel, lubricants, tires and insurance costs, and the base figure for FY-13 was $0.46 per inmate/day in - the reported average transportation costs for all Regional Jails across the State in FY-13 - and adjusted by 2.5% annually.

Direct Jail Support reflects non-payroll facility expenses for office equipment (replacements), communication expenses, supplies, and minor equipment (other than that necessary for the food service and health care functions), travel, inmate and officer uniforms, bedding/towels, cleaning and laundry supplies, maintenance costs and insurance. The average per inmate/day costs reported by the Rockingham-Harrisonburg Regional Jail FY-13 was $7.00. This figure was adjusted annually by 2.5% to estimate future annual costs.

Operating - Capital Accounts reflects expenses related to maintenance activities. The average per inmate/day costs at the Rockingham-Harrisonburg Regional Jail was $1.18 and an average of $1.77 for all Regional Jails in the State in FY-13. The reported FY-13 cost for Rockingham-Harrisonburg used as a base annual figure and inflated by 2.5% per year through the year FY-26.

Other indirect jail expenses reflect other allowable jail expenses – primarily the allocated portion of the jurisdiction's overhead assigned to jail operations. The FY-13 "other indirect jail expenses" for all Regional Jails across the State was $3.25 per inmate/day (Compensation Board Cost Reports). Rockingham-Harrisonburg Regional Jail reported $4.15 costs in this category in FY-13. This figure was used and inflated by 2.5% per year through FY-26.

Contingency was estimated at 5% of non-payroll expenses.

SECTION IX
Construction Cost Estimate

A. TOTAL PROJECT BUDGET

IX. CONSTRUCTION COST ESTIMATE

A. TOTAL PROJECT BUDGET

Rockingham / Harrisonburg Regional Jail Annex			
			Notes
New beds to be constructed = 315			
VADOC PART I - FORMULA DATA			
Means Building Const. Cost Data (2014)		$280.00	**1**
Marshall & Swift Multiplier =	0.99	$277.20	**2**
Inflation to Mid Point Construction (4%)		$335.13	**3**
315 New Beds @ 400 SF/BED		126,000 SF	
TOTAL		$42,226,985	
PART I - PROJECT CONSTRUCTION COSTS			
Building Cost New Construction		$42,226,985	
Sitework		$4,230,581	**4**
Total Project Construction Costs		**$46,457,566**	
PART II - PROJECT SPECIFIC COSTS			
Future core bldg. construction - 15 yr. forecast + 50%		$5,347,746	**5**
Rock removal		$392,925	**10**
Natural Gas line extension		$39,595	**11**
Total Project Specific Costs		**$5,780,266**	
PART III - OTHER PROJECT COSTS			
A/E Fees New Construction	7.0%	$3,657,000	
CBCP/Planning Study		$123,200	
Value Engineering Study		$100,000	
Construction Management by Third Party		$700,000	
Fixtures, Furnishings & Equipment		$1,102,500	**7**
Communications/Data built in wiring, racks		$174,096	**6**
Computer / Phone / Radio system hardware		$200,000	
Test Borings/Testing/Special Inspections		$275,000	
Survey, Topo, Environmental & Utility Locator		$110,000	
Printing & Reproduction		$60,000	
Permits, Fees & Connection Charges		$174,500	
Total Other Project Costs		**$6,676,296**	
Subtotal		$58,914,128	
Contingency		$4,346,714	**8**
Total Project Cost		**$63,260,842**	
Cost per Bed		$183,851.10	**9**

Notes - Construction Cost Estimate – Expansion of the Rockingham / Harrisonburg Regional Jail

1 R. S. Means *Building Construction Cost Data (January 2014),* Square Foot Costs, Median Cost for jails = $280/ SF. For this estimate, the median cost is used.

2 Marshall & Swift Multiplier calculated for Class "A" Construction for Harrisonburg as an average between Winchester and Charlottesville. The Charlottesville factor is .93, and the Winchester factor is 1.05. The average is .99.

3 Calculated based on a construction start date of September 2017 with a 28 month construction; **Mid-Point = November 2018.**
Inflation at 4.0% per year has been compounded per the following formula whereby P is value this date, FV_n = Future Value, Y is the number of years and r is the rate of inflation.
$FV_n = P(1 + r/n)^{Yn}$
Cost is inflated for 4 years and 10 months (January 2014 until mid-point and the resulting factor is 1.209).

4 Site costs are estimated by Valley Engineering, and inflated 4% per year to the mid-point of construction (factor 1.209). Refer to the following site cost estimate.

5 Future core is designed for the Kitchen, Laundry, Intake, Medical, Staff, and Visitation areas of the facility as itemized in Section III of this report. It is designed to accommodate 385 future beds, for a total of 700. 15,957 s.f. x Part I cost per square foot ($335.13).

6 Total based on estimate of non-security structured fiber optic wiring throughout the building for Owner's phone/data systems. Estimated cost $1.00 / s.f. x 4% inflation to mid-point of construction (1.209) = $174,096.

7 Allowance of $3,500/bed

8 Applied to Part I, Part II and Part III costs less A/E Fees, C-BCP and Planning Study costs, value engineering study, and third party construction management.

9 Total Project cost, less future core, divided by 315 beds.

10 Removal of rock is an additional cost beyond normal site work. Estimate of $325,000.00 has been inflated 4% per year to the midpoint of construction (factor 1.209).

11. Extension of Columbia Gas main to the site is an additional cost beyond normal site work. Estimate of $32,750.00 has been inflated 4% per year to the mid-point of construction (factor 1.209)

VALLEY | ENGINEERING
IDEAS MADE REAL

WORK ACTIVITY	QUANTITY	UNIT	UNIT COST	SUBTOTAL	TOTAL
ON-SITE PREPARATION					
Site Clearing					
Clearing	24.33	AC	$5,600.00	$136,248.00	
Topsoil Strip/Cut	19600.00	CY	$1.50	$29,400.00	
Topsoil Fill	19600.00	CY	$1.50	$29,400.00	
Topsoil Export	0.00	CY	$8.00	$0.00	
Total Site Clearing				**$195,048.00**	**$195,048.00**
Grading Cut					
Earth Cut	162000.00	CY	$4.00	$648,000.00	
Rock Cut (Part II cost)	13000.00	CY	$25.00	$325,000.00	
Unsuitable Cut	0.00	CY	$5.00	$0.00	
Pipe Earth Cut	0.00	CY	$16.00	$0.00	
Pipe Rock Cut	0.00	CY	$11.00	$0.00	
Total Grading Cut				**$973,000.00**	**$973,000.00**
Grading Fill					
Earth Fill	175000.00	CY	$4.00	$700,000.00	
Import/Borrow Fill	0.00	CY	$12.00	$0.00	
Desired Import	0.00	CY	$0.00	$0.00	
Pipe Earth Fill	0.00	CY	$16.00	$0.00	
Pipe Earth Import	0.00	CY	$16.00	$0.00	
Total Grading Fill				**$700,000.00**	**$700,000.00**
Grading Export					
Earth Export	0.00	CY	$8.00	$0.00	
Rock Export	0.00	CY	$8.00	$0.00	
Unsuitable Export	0.00	CY	$8.00	$0.00	
Desired Earth Export	0.00	CY	$0.00	$0.00	
Pipe Earth Export	0.00	CY	$8.00	$0.00	
Pipe Rock Export	0.00	CY	$8.00	$0.00	
Total Grading Export				**$0.00**	**$0.00**
Retaining Wall	**0.00**	**SF**	**$25.00**		**$0.00**
Other Preparation					
Fine Grading (Building)	27300.00	SY	$1.00	$27,300.00	
Fine Grading (Non-Building)	21300.00	SY	$1.00	$21,300.00	
Erosion Control	24.33	AC	$2,500.00	$60,825.00	
Seeding	14.33	AC	$2,400.00	$34,392.00	
Total Other Preparation				**$143,817.00**	**$143,817.00**
				TOTAL	**$2,011,865.00**

ON-SITE IMPROVEMENTS

Paving - Asphalt					
Asphalt Paving (Light Duty)	8050.00	SY	$20.00	$161,000.00	
Asphalt Paving (Heavy Duty)	11300.00	SY	$34.00	$384,200.00	
Total Paving - Asphalt				**$545,200.00**	**$545,200.00**
Paving - Pedestrian					
Pedestrian Asphalt	1375.00	SY	$15.00	$20,625.00	
Pedestrian Concrete	2800.00	SY	$20.00	$56,000.00	
Total Paving - Pedestrian				**$56,000.00**	**$76,625.00**
Curb & Gutter					
Street/Drive Curb & Gutter	8100.00	LF	$18.00	$145,800.00	
Parking Curb & Gutter	2300.00	LF	$18.00	$41,400.00	
Total Curb & Gutter				**$187,200.00**	**$187,200.00**
Fencing					
12' Non-Scalable w/ Razor Wire	670.00	LF	$75.00	$50,250.00	
16' Recreation Walls (CMU)	11000.00	SF	$25.00	$275,000.00	
				$325,250.00	**$325,250.00**

TOTAL **$1,134,275.00**

ON-SITE STORM DRAINAGE & Misc

Storm Water Pipes					
10 in Pipe	1300.00	LF	$20.00	$26,000.00	
12 in Pipe	500.00	LF	$25.00	$12,500.00	
15 in Pipe	750.00	LF	$37.00	$27,750.00	
18 in Pipe	1250.00	LF	$41.00	$51,250.00	
24 in Pipe	300.00	LF	$59.00	$17,700.00	
30 in Pipe	150.00	LF	$76.00	$11,400.00	
36 in Pipe	0.00	LF	$96.00	$0.00	
Total Storm Piping				**$146,600.00**	**$146,600.00**

Manholes	5.00	EA	$3,000.00	$15,000.00
Storm Inlets	23.00	EA	$3,500.00	$80,500.00
Water 3"	150.00	LF	$35.00	$5,250.00
Water 6"	150.00	LF	$45.00	$6,750.00
Water 8"	1800.00	LF	$55.00	$99,000.00
FH Assembly	5.00	EA	$3,500.00	$17,500.00
Water Meter Assembly / Vault (Part III)	1.00	EA	$20,000.00	$20,000.00
Sewer (8")	1400.00	LF	$50.00	$70,000.00
Natural Gas Main Extension (Part II cost)	250.00	LF	$50.00	$12,500.00
Natural Gas Lateral Extension (Part II cost)	1350.00	LF	$15.00	$20,250.00
Electrical Service	1.00	EA	$0.00	$0.00
SWM (Allowance)	1.00	EA	$150,000.00	$150,000.00
Surveying (Allowance) (Part III cost)	1.00	EA	$50,000.00	$50,000.00
Traffic Control	0.00	EA	$0.00	$0.00
Striping	1.00	EA	$12,500.00	$12,500.00
Mobilization	1.00	EA	$75,000.00	$75,000.00
VSMP Permitting (Part III cost)	1.00	EA	$4,500.00	$4,500.00
Miscellaneous (see Miscellaneous sheet)				$0.00

TOTAL **$785,350.00**

Total Cost Estimate For Site **$3,931,490.00**

Estimate has been generated for preliminary feasibility purposes only.
Shall be refined prior to use in establishing of formal budget.

SECTION X
Project Schedule for Planning and Construction

X. PROJECT SCHEDULE FOR PLANNING AND CONSTRUCTION

Based upon approval by the Commonwealth of Virginia and the decision by the Jail Board to proceed, the following schedule is projected for the project:

Submit CBCP / Planning Study to VDOC for Approval	December, 2014
Board of Corrections approval	July – September, 2015
Legislative Project approval	March - April, 2016
Notice to Proceed - Design	April, 2016
Complete Schematic Design and Design Development Documents	November, 2016
Value Engineering	December, 2016
Complete Construction Documents, secure City / County approvals	May, 2017
Receive bids	July, 2017
Notice to Proceed (Construction)	September, 2017
Substantially Complete Construction	January, 2020
Final Completion of Project	February, 2020
Receive Inmates	March, 2020

NOTE: Mid-point of construction is November 1, 2018

PLANNING STUDY
for
ROCKINGHAM/HARRISONBURG
REGIONAL JAIL ANNEX

SECTION XI
Appendix

GEOTECHNICAL REPORT
(Not available for First Draft printing)

COUNTY of ROCKINGHAM
CITY of HARRISONBURG

COUNTY of ROCKINGHAM
CITY of HARRISONBURG

EXISTING 30' UTILITY
EASEMENT for WATERLINE
D.B. 1206, Pg. 672
PLAT FILE "A", SLIDE 139

EXISTING 60'
RIGHT-of-WAY
D.B. 528, Pg. 725

CITY of HARRISONBURG
COUNTY of ROCKINGHAM

LINE OF FUTURE EXPANSION

DELIV./ LOADING

FENCED REFUGE YARD

LINE OF FUTURE EXPANSION

PRISONER TRANSFER SALLY PORT

COMMUNITY CUSTODY PARKING: 41 SPACES

FENCED REFUGE YARD

JAIL ANNEX
F.F. = 1278.00'

COMMUNITY CUSTODY ENTRY

STAFF ENTRY

PUBLIC ENTRY

EXISTING WATERLINE EASEMENT (SHADED)
D.B. 1788, Pg. 647

EXISTING 20' WATERLINE EASEMENT
D.B. 610, Pg. 346

EX. 12" WATER MAIN

PUBLIC/VISITOR PARKING: 44 SPACES

EXISTING 20' WATERLINE EASEMENT
D.B. 737, Pg. 172

EXISTING 20' WATERLINE EASEMENT
D.B. 610, Pg. 346

STAFF PARKING: 126 SPACES

EXISTING 60' RIGHT-of-WAY
D.B. 771, Pg. 140

EX. 12" WATER MAIN

EXISTING 50' ACCESS EASEMENT
D.B. 1039, Pg. 484

PROBABLE SWM AREA

EX. 8" SAN. SEWER MAIN

SAN

SPRING ROAD

(60' RIGHT-of-WAY)

PROPERTY PERIMETER

CHESAPEAKE WESTERN RAILWAY

(100' RIGHT - of - WAY)

SAN

WILLOW

SCALE: 1"=80'

VALLEY | ENGINEERING
IDEAS MADE REAL

MOSELEY ARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690
MOSELEYARCHITECTS.COM

PROGRESS
PRINT NOT FOR
CONSTRUCTION

ROCKINGHAM / HARRISONBURG
REGIONAL JAIL PLANNING STUDY

WILLOW SPRINGS ROAD, HARRISONBURG, VIRGINIA

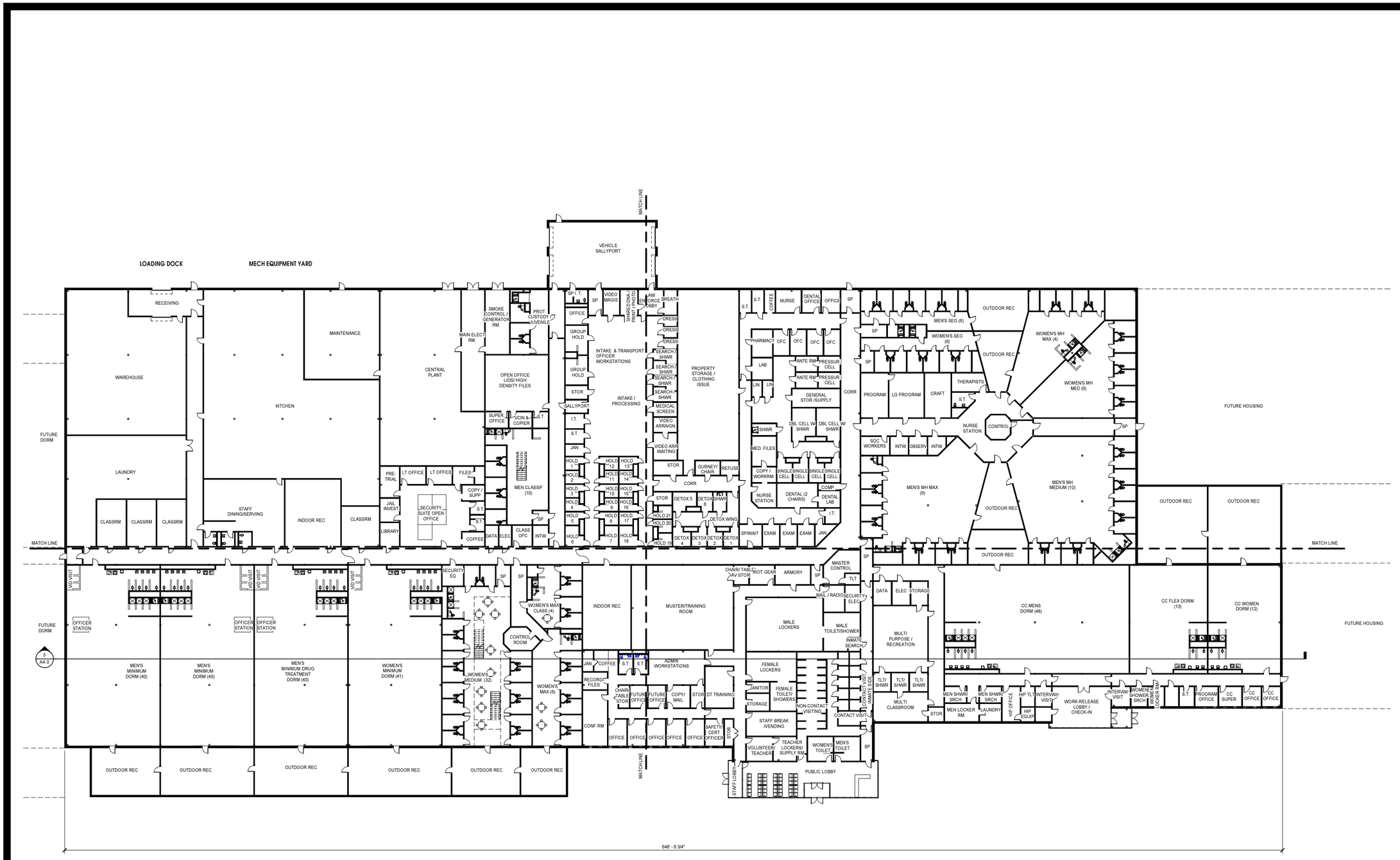
PROJ.:	DATE:
545124	11/20/14

REVISIONS	
DATE	INITIAL

SITE PLAN

C1.0

11/20/2014 9:25:33 AM



N

OVERALL FLOOR PLAN

0' 10' 20' 40'

11/19/2014 5:26:34 PM

MOSELEYARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-3990
MOSELEYARCHITECTS.COM

PROGRESS PRINT NOT FOR CONSTRUCTION

ROCKINGHAM / HARRISONBURG REGIONAL JAIL PLANNING STUDY

WILLOW SPRING ROAD, HARRISONBURG, VIRGINIA

PROJECT NO:	DATE:
545124	NOVEMBER 20, 2014

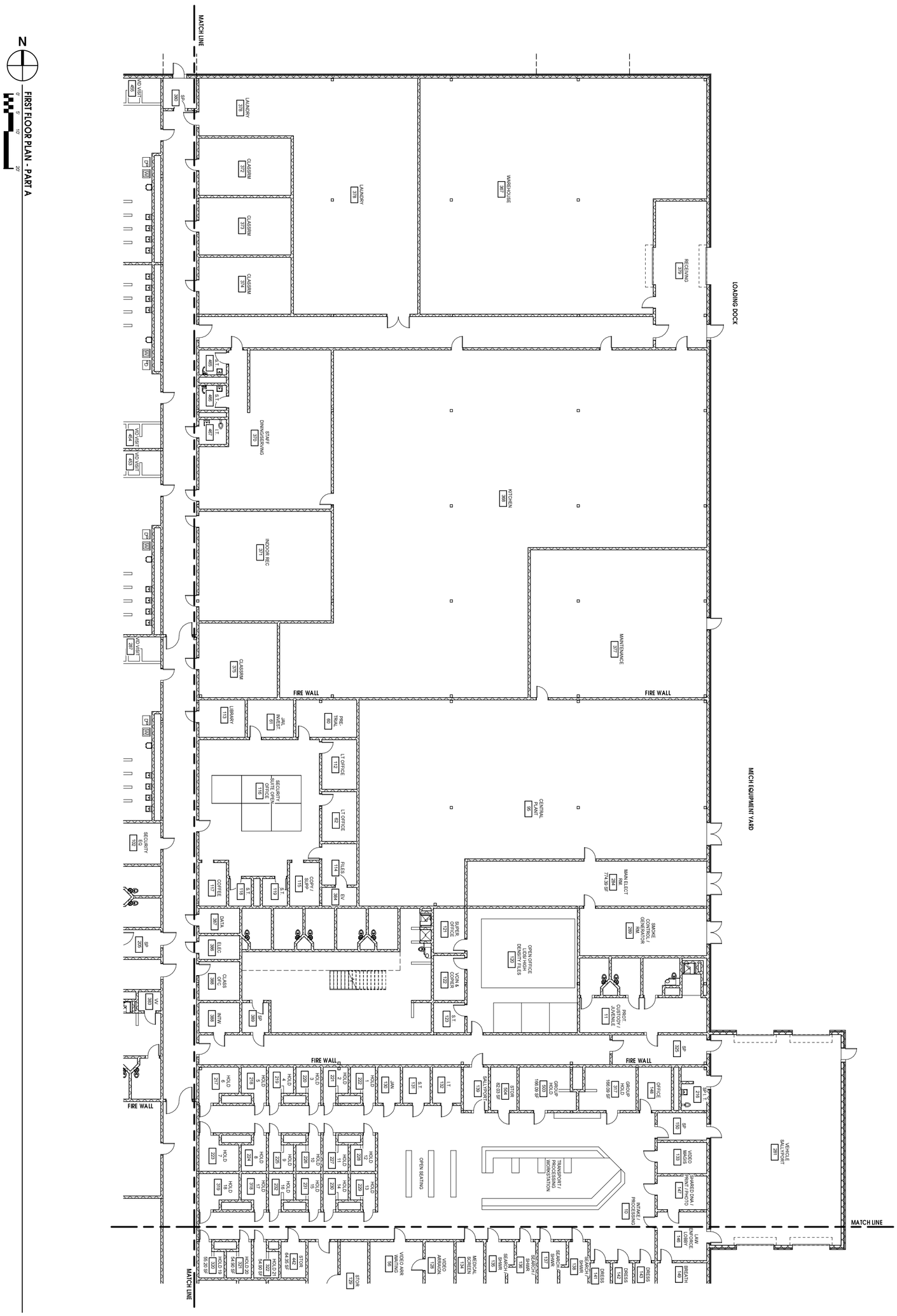
REVISIONS

DATE	DESCRIPTION

OVERALL FLOOR PLAN

A2.0

11/19/2014 5:28:45 PM



FIRST FLOOR PLAN - PART A

FLOOR PLAN - PART A

A2.1

DATE	REVISION DESCRIPTION

PROJECT NO. 546124
DATE NOVEMBER 20, 2014

ROCKINGHAM / HARRISONBURG REGIONAL JAIL PLANNING STUDY

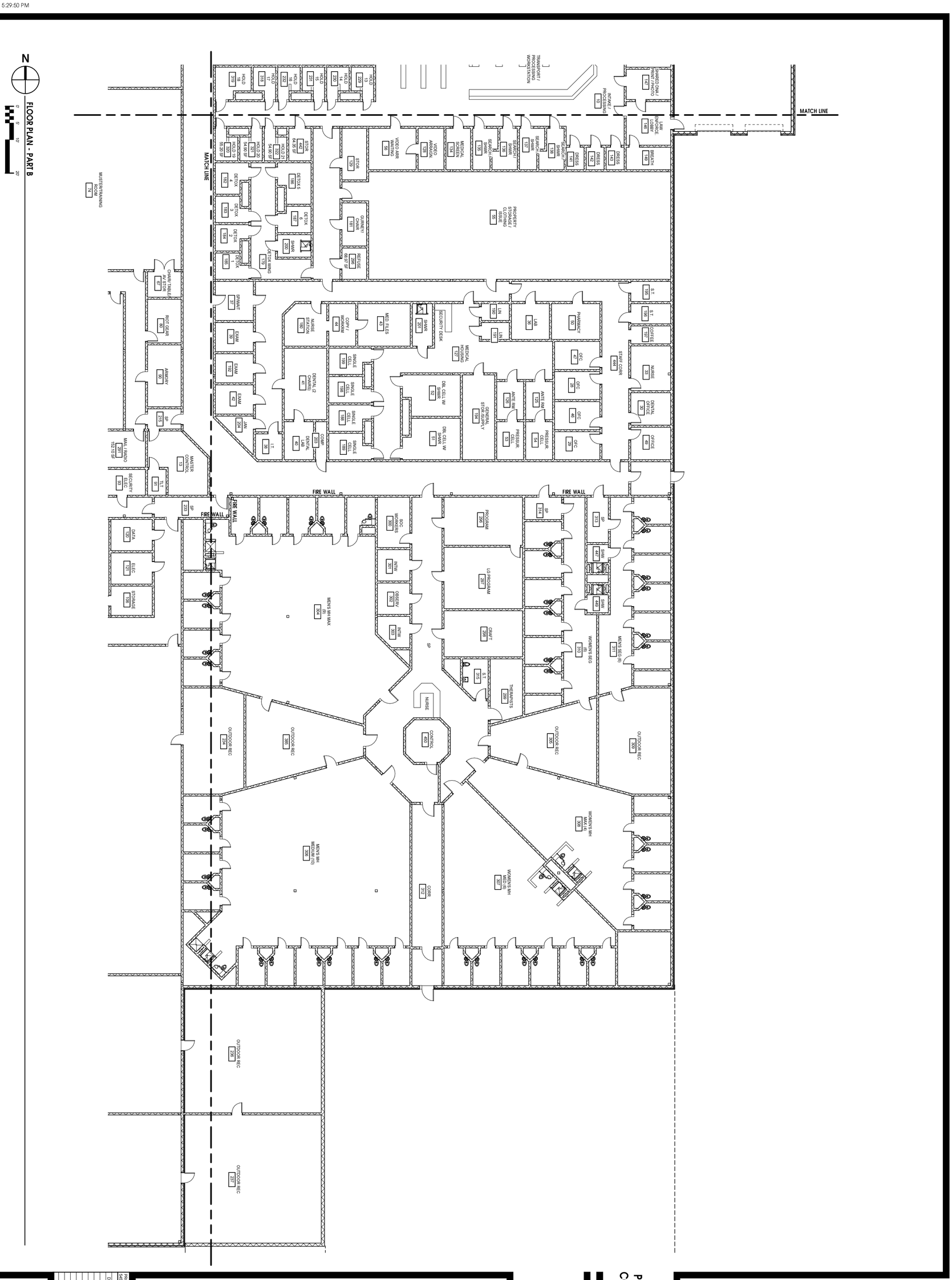
WILLOW SPRING ROAD, HARRISONBURG, VIRGINIA

PROGRESS PRINT NOT FOR CONSTRUCTION

MOSELEYARCHITECTS

3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690
MOSELEYARCHITECTS.COM

11/19/2014 5:29:50 PM



FLOOR PLAN - PART B

A2.2

PROJECT NO	DATE
54024	NOVEMBER 20, 2014

DATE	REVISION DESCRIPTION

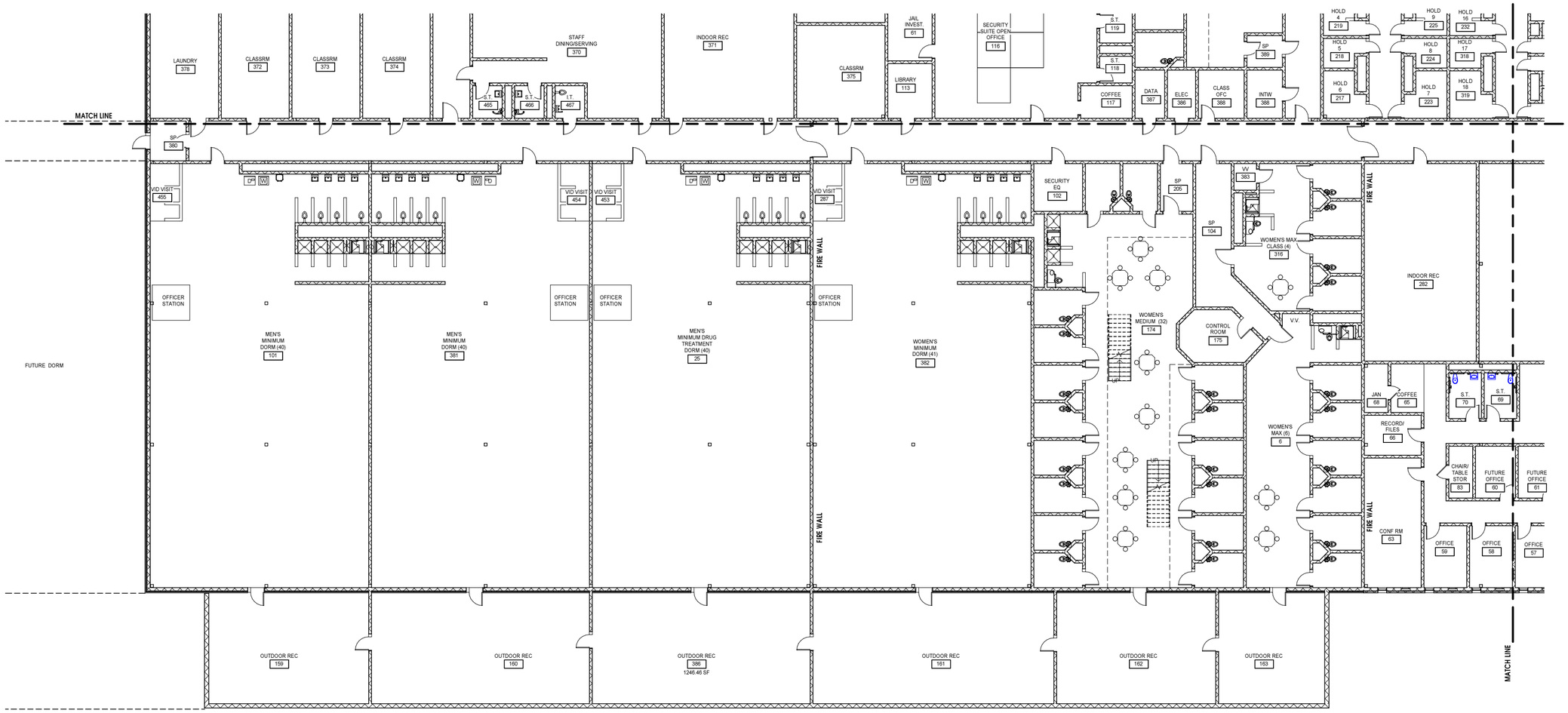
ROCKINGHAM / HARRISONBURG REGIONAL JAIL PLANNING STUDY

WILLOW SPRING ROAD, HARRISONBURG, VIRGINIA

PROGRESS PRINT NOT FOR CONSTRUCTION

MOSELEYARCHITECTS

3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690
MOSELEYARCHITECTS.COM



N

FLOOR PLAN - PART C

0' 5' 10' 20'

MOSELEY ARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5990
MOSELEYARCHITECTS.COM

PROGRESS PRINT NOT FOR CONSTRUCTION

ROCKINGHAM / HARRISONBURG REGIONAL JAIL PLANNING STUDY

WILLOW SPRING ROAD, HARRISONBURG, VIRGINIA

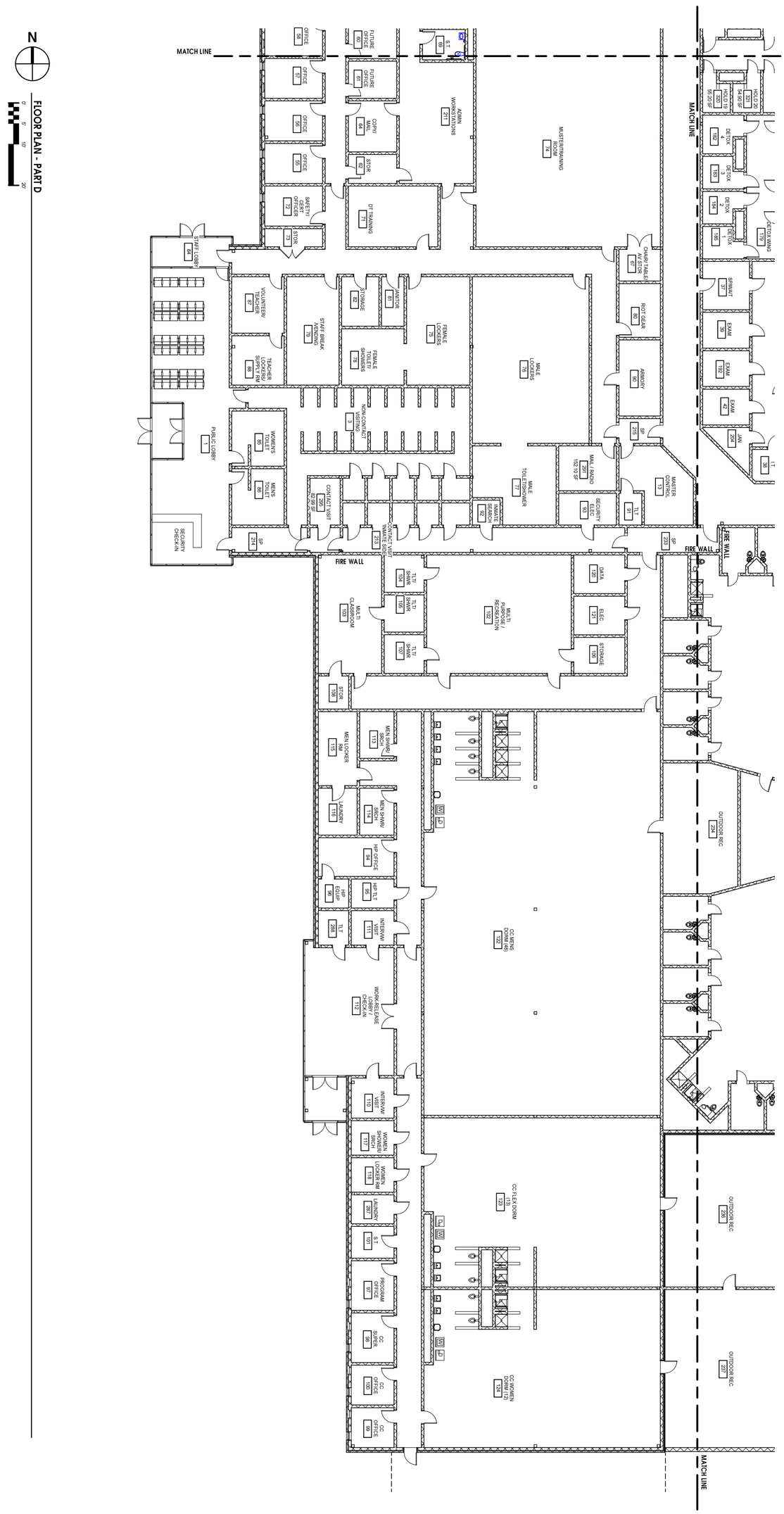
PROJECT NO: 545124	DATE: NOVEMBER 20, 2014
REVISIONS	
DATE	DESCRIPTION

FLOOR PLAN - PART C

A2.3

11/19/2014 5:30:46 PM

11/19/2014 5:33:08 PM



N

0 5 10 20

FLOOR PLAN - PART D

FLOOR PLAN - PART D

A2.4

PROJECT NO	DATE
54024	NOVEMBER 20, 2014
DATE	DESCRIPTION

ROCKINGHAM / HARRISONBURG REGIONAL JAIL PLANNING STUDY

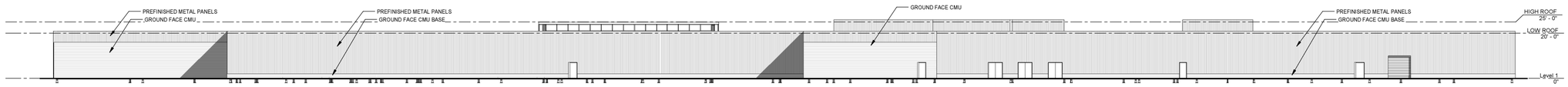
WILLOW SPRING ROAD, HARRISONBURG, VIRGINIA

PROGRESS PRINT NOT FOR CONSTRUCTION

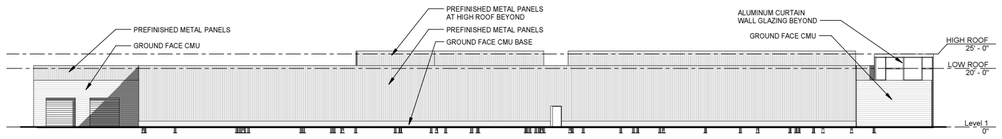
MOSELEYARCHITECTS

3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690

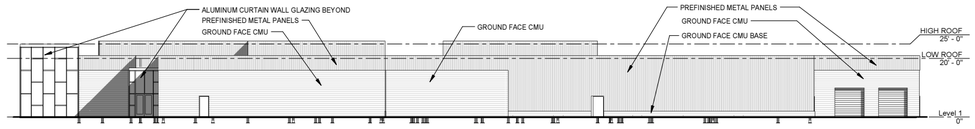
MOSELEYARCHITECTS.COM



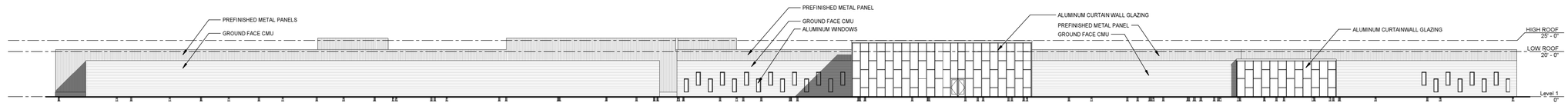
EAST ELEVATION
1" = 20'-0"



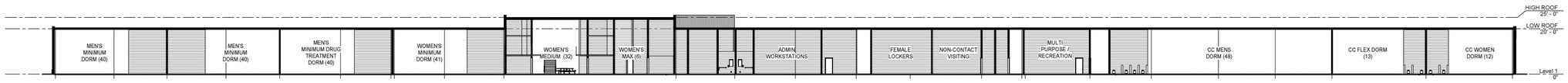
NORTH ELEVATION
1" = 20'-0"



SOUTH ELEVATION
1" = 20'-0"



WEST ELEVATION
1" = 20'-0"



5
A2.0 A4.0

NORTH-SOUTH BUILDING SECTION
1" = 20'-0"

11/19/2014 5:35:00 PM

MOSELEYARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690
MOSELEYARCHITECTS.COM

PROGRESS
PRINT NOT FOR
CONSTRUCTION

ROCKINGHAM / HARRISONBURG REGIONAL JAIL PLANNING STUDY

WILLOW SPRING ROAD, HARRISONBURG, VIRGINIA

PROJECT NO:	DATE:
545124	NOVEMBER 20, 2014

REVISIONS

DATE	DESCRIPTION

ELEVATIONS &
BUILDING
SECTION

A4.0