

# **NOTE REGARDING DETAILED VENUE ANALYSES**

## **Detailed Venue Analysis**

During the due diligence process, a series of Venue Synopses were created (see Section 4.2) for potential 2026 OPWG venues. Each Venue Synopsis has a related Venue Brief, created by a team of Olympic experts, addressing Games hosting requirements. Through each Venue Brief, a series of capital work gaps were discovered. Those capital work gaps created the scope of work for CBEC's architectural, engineering and costing teams to investigate. Their findings were compiled into a Venue Report for each venue. Within each Venue Report, a Quantity Surveyor included a costing report showing multiple options for capital works and their pertaining cost. From those reports, CBEC's MFP team, including Olympic advisors, created a master costing spreadsheet. The identified costs were selected based on a process of evaluation utilizing the MFP Guiding Principles.



## APPENDIX 4H

# **DETAILED VENUE ANALYSIS: BMO CENTRE AND BIG FOUR BUILDING**

# **CALGARY BID EXPLORATION COMMITTEE**

## **VENUE BRIEF:**

### **Stampede Park: BMO Centre & BIG 4 Building**

### **PROPOSED International Broadcast Centre and Main Press Centre**

### **CALGARY, ALBERTA, CANADA**

#### **PREPARED FOR**

CALGARY BID EXPLORATION COMMITTEE, Master Facilities Plan

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#### **DATE**

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## **INTRODUCTION**

As part of an exploratory exercise to determine the feasibility of Calgary presenting a bid to host another Olympic and Paralympic Winter Games, a high level survey and study was conducted to review potential major competition and non-competition sites. One of the primary components of the exercise was to look at where there were synergies between venues and maximize existing infrastructure and transportation links/corridors.

The ability to cluster venues into precincts and parks provides, substantial efficiencies in operations readiness, time, and costs. The Calgary Bid Exploration Committee (CBEC) focused their attention on Stampede Park and its venues for these existing efficiencies. BMO and Big Four, located within the Stampede Park, have been identified as the potential sites for the International Broadcast Centre (IBC) and the Main Press Centre (MPC).

The information contained in this document is to provide the Calgary Bid Exploration Committee (CBEC), Facility Owners, and Planning Teams further information on venue use, spatial requirements, and any challenges that need to be explored regarding this venue.

## **PROPOSED SCOPE & WORKING ASSUMPTIONS**

The BMO and Big Four have been proposed as non-competition venues, hosting the following operations:

**Venue:** BMO

**Operations:** International Broadcast Centre (IBC)

**Venue:** Big Four

**Operations:** Main Press Centre (MPC)

Throughout the exploratory discussions the following working assumptions have been applied:

- The Big Four would remain in place;
- The MPC and IBC space requirements to be considered using the Big Four and BMO with the assumption that Hall F expansion is added prior to 2026;
- IBC venue to be approximately 43,000m<sup>2</sup> gross, with a minimum of at least 35,000m<sup>2</sup> net area;
- MPC venue to be approximately 20,000 m<sup>2</sup>;
- Full use of the venues are available for Olympic and Paralympic use including external compounds, parking, and all ancillary spaces. Shared or exclusive use periods to be determined during venue use agreement planning phase;
- Venue is located within Stampede Park, secure perimeters, vehicle and pedestrian screening, transport operations, and other amenities and services are provided for within the common domain or by the park;
- Roof structure has the capacity to hold additional loads for technology, lighting, cameras, audio, flags, and banner's;
- Toilets are code compliant and meet all accessible guidelines and best practice;
- Concessions are in good working condition with all services operational, code compliant, and accessible;
- HVAC is fully operational and able to meet games requirements for temperature and humidity levels or is feasible for modification;



- The Big Four venue will require upgrades to the lighting levels to meet MPC operational requirements;
- The Big Four venue will require surface upgrades with paint, cleaning, and touch ups to be games ready.

The material below is a non-exhaustive listing of the major areas and will act as a preliminary benchmarking tool when assessing both venues overall ability to operate as the IBC and MPC venues. Using this material will provide the information needed to complete the next series of space studies to confirm flows, functional area space allocation, and develop further confirmation of required permanent works necessary.

As part of the Stampede Park, there needs to be further dialogue around the overall site access, egress, vehicular flows and Security Footprint, but as an initial phase of work the brief below will advise as to baseline requirements. There is minimal reference to the interior spatial requirements for specific agency spaces or studios as the facilities have the primary requisites within their standard operating design, any gaps observed are noted at the end of the document for consideration. Further information on the Broadcasters and Press Agencies requirements will come later in the process.

## **IBC AND MPC BASELINE REQUIREMENTS**

### **1 | International Broadcast Centre (IBC)**

The International Broadcast Centre (IBC) is the centre for broadcasting operations for the Olympic and Paralympic Games. All television and radio signals for Olympic and Paralympic coverage will pass through the IBC under the direction of the Olympic Broadcasting Service (OBS). All technical operations, broadcast services, OBS offices, and Rights Holding Broadcaster (RHB) offices and studios are housed within the IBC.

The IBC is one of the first facilities to become fully operational and operates 24 hours daily. The IBC is typically part of the Main Media Centre (MMC), which includes the Main Press Centre (MPC) and an area which will host the common MMC services. The IBC should be situated as close as possible to the MPC and other key competition venues, as well as broadcast accommodations, and the public transportation network.

#### **a. IBC Technical Requirements**

##### **i. General IBC Requirements**

Provide an existing Exhibition Centre-type facility, new construction or large building shell (warehouse) easily retrofitted and conveniently located to venues and public services (transportation, accommodation, restaurants, etc.).

Basic building requirements include:

- General air conditioning and heating for office use;
- Access to domestic and technical power;
- Existing floor space, finish to be concrete with carpet;
- Basic cleaning/janitorial services;
- Provision of waste containers and removal of waste;
- General use of IBC facilities;
- Ceiling height must be a minimum of 9 meters high, fully clean between floor and the lowest point of any services in the ceiling. These services include: HVAC ducts, cable trays and other protruding structural elements;



**ii. Possession, Move-In/Out, Retrofit, Handover, and Services**

Organizing Committee Olympic Games (OCOG) to take full possession of the facility for the IBC and hand it over to OBS, allowing sufficient time for fit out and overlay. Timing for handover will change dependent on the type of facility, but should be a minimum nine (9) months before the Olympic Winter Games for the IBC. The facility should also be the IBC for the Paralympic Games, unless otherwise agreed upon with the IOC. A minimum period of three weeks from the date of the Closing Ceremony of the Paralympic Games needs to be allowed for the tasks of move out and retrofitting by OBS.

**iii. Organizing Committee Olympic Games (OCOG) Space Allocation**

Spaces within the IBC are dedicated to the OCOG for providing facilities and services, including common services and other areas such as telecommunications, and power rooms.

**iv. Heating, Ventilation and Air Conditioning (HVAC)**

Common heating and air conditioning to be provided at levels comfortable for the working environment throughout the building beginning from construction phase through tear down, including water chillers, air handling units, exhaust fans, sound attenuators, fire dampers, grilles and registers in finished spaces, ductwork, piping and control and monitoring system.

- Humidity Control to be between 40% and 50% - relative humidity;
- OCOG to secure access for modifications to the horizontal ducting system for the required vertical extensions, if needed by OBS;
- Building HVAC system must be sufficient enough to service the common areas of the building and those areas of OBS and RHB space with and without ceilings, keeping temperature levels between 19- 23° c and operating at less than 35 dB(a);
- OCOG will need to guarantee the following acceptable noise levels inside the building (regardless of noise origin) before the delivery of spaces to OBS for the fit out and for adequate Games-time operation of the IBC;
- A concurrent satisfaction of all three following maximum noise level requirements: 35 dB(a), 50 dBC and NR-30, measured under the following conditions.
- Provide the ability for OBS to augment and supplement building HVAC system if required.

**v. Fire Services and Egress**

Facility to be provided for fire prevention infrastructure per local code (sprinklers, extinguishers, etc.). Service begins during construction phase through tear down, escalating towards Games-time, including 24-hour fire brigade on-site and central fire detection panel with amplifying panel. Sprinkler system, dry where required, should come with the building. No low level sprinkler system should be placed in low level fit out offices. Coordination with fire authorities for variances in codes in OBS constructed spaces due to nature and specialization of the construction project.

**vi. Maintenance/Control Systems:**

All maintenance of the building and its services, including Building Management Systems (BMS) to control mechanical (including detailed environmental conditions in IBC areas), electrical (including grid power status and backup power status and operations), electrical, and plumbing systems to be provided.

**vii. Lighting**

Provide lighting of common areas, general overhead lighting for areas reserved for the fit out works, building services areas, the IBC Compound/Satellite farm area, and parking facilities. General lighting should be a minimum of 400 lux.

**viii. Plumbing**

Provide water and waste to all restrooms, kitchens and other possible wet spaces including all IBC break areas.

**ix. Energy Requirements**

Power is to be supplied from the grid with full redundancy (e.g. main and synchronized Backup Medium Voltage power coming from geographically independent substations with diverse cabling and automatic sub-second transfer switching).

Minimum power capacity of 15 MW for the IBC with a net of 9 MW available for Broadcaster use.



Full power for the broadcast loads, including power for HVAC, to be locally backed up by standby twinpack generators to be arranged by the Organizing Committee. Generators and interconnection switchgear sets will be able and configured for automatic and manual synchronized engagement and disengagement with the grid power. All medium to low voltage transformers will be available with N+1 redundancy. By-passable isolation transformers are required for all the technical power distribution. Space to be provided for a generator compound on the exterior of roughly 1,000m<sup>2</sup>.

**b. IBC Internal Program Requirements.****i. General Space Allocation**

IBC requires an area approximately 43,000m<sup>2</sup> gross, but at least 35,000m<sup>2</sup> net, clean and conveniently shaped for the internal fit out of broadcast facilities.

Gross size incorporates the internal fit out of broadcast facilities for both Olympic Broadcast Services (OBS) and the Rights Holding Broadcasters, but also any necessary common areas for people circulation, welfare, etc.

Space is required within or adjacent to the building for loading docks for equipment deliveries (pre-Games) and services (pre-Games/Game time/ tear down).

The overall area is divided between IBC Technical Facilities, IBC Services, and OBS and OCOG required space for operations and management.

IBC Technical Facilities include Contribution and Distribution, Transmission, Multichannel Distribution Systems Technical Area, Commentary Switching Centre, Olympic News Channel Production Areas, VTR Recording Room, Archive Services, Broadcast Operations Centre (BOC), and Production Quality Control.

IBC Services provided by OBS include IBC Booking Office, Information Office, Daily Office, IBC Stand-Up, RF Platform, IBC Studio, and common area services.

**ii. Daily Briefing**

Provide space and furniture, podium, and Audio /Visual equipment for OBS to host daily briefing with broadcasters. Capacity of space is roughly 500 seats.



**iii. Food Service**

Food service facilities to be provided, including restaurants for cafeteria and fine dining. Some Rights Holders may have additional food service requirements for their individual IBC.

**iv. Storage**

Space should be available on-site, to store equipment boxes, crates, etc., located in an unfinished and secure area of the building, with adequate access for loading and unloading. Space must be equipped with necessary power and lighting.

**v. Water Stations**

Water areas to be provided in the venue through existing drinking fountains or water fill stations. Water to be tested for drinking water use. Number of stations to be compliant with venue capacity and located throughout the common areas.

**vi. Broadcast Medical**

Use of the existing medical areas to be provided. If the existing medical does not exist, a space of approximately 50m<sup>2</sup> is required. The space needs to have water and drainage, along with direct access to an accessible toilet.

**vii. Broadcast Toilets**

Use of all existing toilets to be provided. A thorough review of the existing toilets to be completed to determine if upgrades are required to ensure all toilets provide the required accessibility provisions to meet best practice and code compliance per the venue capacity.

**c. IBC External Program Requirements**

**i. Compound / Satellite Farm**

Space is required immediately adjacent to the main IBC buildings for compound operations/satellite farm with unobstructed access to the satellite horizon. Technical and domestic power supply, backup (twin packs and UPS) and distribution required, along with cable paths from compound/satellite farm to exterior of IBC with geographical diversity. Double fencing is required, and the area is 5,000m<sup>2</sup> for the IBC and 1,000m<sup>2</sup> for the MPC.

Within the compound/satellite farm, several cabin structures will be required for IBC offices to manage compound/satellite farm, motor pool operations, and any overflow office facilities for OBS and RHS's.

## **ii. Parking/ENG drop**

Parking for the facilities are required within or adjacent to the IBC structure (no more than 250m from entrance). The IBC requires a minimum of 600 parking stalls and ENG drop should be located near the IBC main entry, no more than 50m from the entry for easy access for equipment and personnel drop.

## **iii. Transport Mall**

A transport mall is required for busing of IBC personnel to and from venues during games, with an area of roughly 2000m<sup>2</sup>.

## **iv. Security**

24-hour site security (including compound/ satellite farm, parking and any other areas considered part of the IBC) is required, along with fencing/perimeter control, monitoring of all access points, and internal roaming/ control points.

## **v. Guest Pass Office (GPO)**

Tent or office space located as close as possible to the IBC entrance, with multiple GPO required if there are entrances. Office(s) are to be accessible for accredited and non-accredited personnel, OBS to confirm size during planning process – roughly 400m<sup>2</sup>.

## **vi. Heliport**

A helicopter landing and staging area is required for the IBC.

# **2 | Main Press Centre (MPC)**

The Main Press Centre (MPC) is the central work place of the accredited print media at the Olympic Games and Paralympic Games, providing facilities and 24-hour support. The location of the MPC is a key factor in the success of the Games media coverage. It should be

situated as close as possible to the IBC and other key competition venues, as well as media accommodation, and the public transportation network.

The MPC site will include media transport hub with bus stops and waiting areas for busses connecting with competition venues and media accommodation sites. The MPC should be located in an existing or planned exhibition centre that can be easily adapted to Games requirements.

**a. MPC Internal Program Requirements**

**i. Media Centre Main Lobby**

A welcome lobby with multiple services is required for the MPC, these spaces include; information points, transport desk, rate card offices, info terminals, and miscellaneous offices. The area for these spaces should be roughly 200m<sup>2</sup>, with additional circulation for peak capacity of the media in and out of the MPC.

**ii. Media Work Areas**

Large open floor work areas for press and photo to be provided. These spaces also require additional lighting to turn non-office space into work areas, along with distribution of power and technology to all work stations. The total area to be provided is roughly 5000m<sup>2</sup> dependent on layout for circulation to accommodate 600 workstations.

**iii. Private Offices and Storage**

Agency offices are required for over 50 news agencies. Temporary build out of these areas is required with services distribution for power and technology – along with lighting and acoustics as required. The area that should be considered for these spaces is 4,100m<sup>2</sup>.

**iv. Media and Photo Lockers**

Locker rooms for media and photo storage is required for a total of 600 lockers. The area required for this 200m<sup>2</sup>.



**v. Press Conference Room**

Different size conference spaces are required for the MPC, this includes a main conference room (500 person) and two smaller conference rooms (200 Person & 100 Person). The area total is roughly 850m<sup>2</sup>.

**vi. Media Dining**

Various dining options, snack, and coffee areas are required for the MPC. An area for the dining should be roughly 1000m<sup>2</sup>, with an additional 1500m<sup>2</sup> for kitchen and storage space to be provided.

**vii. OCOG Operational Spaces**

To manage and operate the MPC, there are areas required to support the media, they include; the media relations office, IOC office, ticketing offices, transport offices, language services, and press support, as examples, along with workforce and other BOH operational spaces. The area required is roughly 2000m<sup>2</sup>.

**viii. Technology Services**

Areas are required for technology services for the press, they include; the main help desk, call centre, intervention room, runners dispatch area, support desk, copy centre, and intercom/voice, along with various additional offices and storage spaces. The area required is roughly 850m<sup>2</sup> for all these spaces. Dependent on readily available connections to fibre, there may be a requirement for compound spaces for technology and cellular structures, staging, along with containers for equipment and storage. This storage can be in the form of a tent or several containers. The compound space required is roughly 500m<sup>2</sup>.

**ix. National Organizing Committee (NOC) and OCOG Office Spaces**

Office spaces are required for the IOC, the next Olympic Games OCOG, IPC Office, Olympic News Service (ONS), and other NOC spaces. This area is roughly 900m<sup>2</sup>.

**x. Media Toilets**

Use of all existing toilets to be provided. A thorough review of the existing toilets to be

completed to determine if upgrades are required to ensure all toilets provide the required accessibility provisions to meet best practice and code compliance per the venue capacity.

**xi. Media Medical**

Use of the existing medical area to be provided. If the existing medical does not exist, a space of approximately 50m<sup>2</sup> is required. The space needs to have water and drainage, along with direct access to an accessible toilet.

**xii. Water Stations**

Water areas to be provided in the venue through existing drinking fountains or water fill stations. Water to be tested for drinking water use. Number of stations to be compliant with venue capacity and located throughout the common areas.

**b. MPC External Program Requirements**

**i. Parking/ENG drop**

Parking is required within or adjacent to the MPC structure (no more than 250m from entrance), and requires a minimum of 200 parking stalls.

**ii. Transport Mall**

A transport mall is required for busing of media personnel to and from venues during Games, this area is shared with the IBC.

### **3 | IBC/MPC Common or Shared Spaces**

There are several common or shared spaces that both the IBC and MPC require along with central OCOG venue management and functional area operations. In order to streamline for efficiencies, these operations and common services provide support and services to both instead of duplicating. Mainly these services are BOH and operations, however, dining and common services provided in the "Main Street" are FOH and require easy access to both the IBC and MPC.

**a. IBC/MPC Internal Shared or Common Spaces****i. Common Services**

There are several common service areas that are required for both the IBC and MPC, and should be located in a common space with easy access from both centres. This space is commonly called the “Main Street” with the following services requirements:

- Banking Services, ATM
- Business Centre
- Customs Broker
- Information Desk, Olympic Games and General
- Medical Services (doctors & nurses), First Aid, ambulance on stand-by
- Newsstand
- Facsimile/Photocopy Equipment
- Shipping & Receiving services
- Sundries & Souvenir Shop
- Technology Support
- Telecommunications Support
- Transportation Information Desk
- Travel Agency
- Postal and Courier Services
- Photo
- Pharmacy
- Restaurants/Bars
- Language Services
- Laundry Service
- OCOG Rate Card Office
- Coffee Shops

**b. IBC/MPC FOH/BOH External Program Requirements****ii. Venue Perimeter**

A venue perimeter fence line is required for all venues within the park. This fence should be



a minimum of 1.8m high, and ballasted to ensure stability in the event of heavy winds, creating a perimeter footprint of roughly 1-2m in depth. The fence will be covered in fence fabric with the look of the games with entry and egress points. This enables the flexibility for Stampede Park to allow access to the park without tickets to a competition venue, and controls access to the Media Centres.

### **iii. Food and Beverage (FAB) Compound**

The food and beverage compound is the space for storage of both food and beverages, along with kitchen and food prep areas. Dependent on the venue, a temporary kitchen and additional storage is necessary to service all the additional lounges and food services outside concessions and standard venue operations. FAB sponsors, i.e. Coke, will also provide their own containers for storage on site and require a minimum of 1.5 days storage of products. This compound also requires offices, workforce areas, toilets, connections to water, waste, power, and easy truck access for daily off-hours food delivery. The compound space required is approximately 1500-2000m<sup>2</sup>, depending on existing venue kitchen facilities.

### **iv. Cleaning and Waste (CNW) Compound**

The cleaning and waste compound is an area for the staging of the large mobile collection bins, bin wash down area, compactors for the required waste streams, storage of CAW cleaning and paper products, along with offices. The compound space required is approximately 800m<sup>2</sup> with an additional area of 1000-2000m<sup>2</sup> of snow removal equipment and snow storage.

### **v. Workforce (WKF) Check-In and Break**

An area to be provided for workforce check-in and break areas adjacent to the venue and workforce accredited entry to the venue. These spaces can be in a tent structure, with workforce check-in space allocation at approximately 150m<sup>2</sup> and workforce break at approximately 500m<sup>2</sup>.

### **vi. Logistics (LOG) Compound**

The logistics compound requires space for an office cabin, toilets, staging, and storage space. Additionally, this compound will provide containers for storage for other functional

teams, dependent on in-venue storage, as well as parking for large equipment and vehicles. This compound is approximately 1000m<sup>2</sup>, and must be secured due to the equipment and goods stored.

#### **vii. Site (VED) Management Compound**

The site compound requires space for offices, toilets, staging, and storage areas for Site Management along with Energy, Look of the Games, and Signage and Wayfinding. Additionally, this compound requires parking for large equipment, vehicles, and spares with an overall compound space requirement of approximately 1000m<sup>2</sup>, and must be secured due to the equipment and goods stored.

#### **viii. Security (SEC) Operations**

As a venue within the Stampede Park, a full PIDS system is not required, only a secure fence line and controlled entry points to separate and delineate the venue from other park venues and operations. These control points have accredited security check-points for the media and accredited staff.

In addition, security operations require offices, control centre, briefing, and storage spaces – these can be in the venue or in an external compound tent or cabin structure, with a compound size of approximately 300m<sup>2</sup>. Dedicated power and direct fibre connections are required to support their secure independent servers and operations.

#### **ix. Venue Management Operations**

If space is not available in the venue, a venue operations centre (VOC) is required. This space will house the offices for venue management and miscellaneous functional areas, venue briefing area, venue communications centre, and storage as required. If located externally, these spaces can be in a tent or cabin structure, and is approximately 200m<sup>2</sup>.

### **c. Other Major BOH Program Requirements**

#### **i. Services and Access**

Access to water and waste, along with access to fibre connections is required for BOH compound spaces. In addition, there will be a Field of Play (FOP) and BOH energy

requirement for prime generated power, along with redundancy generated power requirements. Energy compounds are broken into specific areas adjacent to the compounds and the venue with the most direct routes to reduce cable lengths. Roughly 4 compounds should be considered, outside the broadcast (BRD) compound, of approximately 500m<sup>2</sup> each.

## **ii. Parking and Vehicular Access**

Both the IBC and MPC will require dedicated parking adjacent to their facilities, see above. In addition, each BOH compound will require parking within its compound for various operations. Additionally, operational staff require parking – this can be as high as 150 parking stalls, with an area of approximately 4000m<sup>2</sup>.

Further transportation planning with new and existing public and games transportation systems can reduce this number, along with park shuttle systems, but should not be less than 50 stalls for this venue.

BOH road access is dependent on available access routes in and out of the venue from the Park BOH transport and service roads in within the park. A loop in and out of a venue is preferred, allowing for easy access of large trucks without backing up at any point of its entry into a venue. All security VSA's (Vehicle Screening Areas) will occur at park entries and not at this venue.

## **iii. Ambulance Staging**

Emergency services vehicles will also require space within the venue BOH, dependent on the safety plans – fire trucks would be centrally located within the park, however, one ambulance would be required for each centre. These ambulances are located adjacent to the building, with direct access to both the FOP and spectator areas, and require connections to power.



**VENUE TRANSPORT SUMMARY**

Refer to Appendix 4AA

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**VENUE PROFILE SUMMARY**

Venue: BMO building

Location: Stampede Park

Key Contact: Paul Rosenberg

Owner/operator: Calgary Exhibition and Stampede

Current use: Exhibition Centre

	Yes/No	Comments:
FOP standards/IF approval:	No	Broadcast Requires 35,000 m2 net Actual: 29,000m2 including Corral
Operational space	No	None required
External space – FOH	yes	
External space – BOH	yes	
Parking	yes	Some additional required
Utilities services (gas/water):	yes	
Mechanical/electrical:	Yes	Need to provide redundancy and connection for emergency power.
Technology/BMS:	Yes	
Fiber connectivity:	Yes	Redundant fiber
Access & Egress Transit:	yes	Serviced by LRT
Access & Egress Pedestrian:	yes	
Long term use contracts:	Yes	Several exhibition commitments
Capital improvement plan:	Yes	2 phases
Adjacent land (plans in use):	yes	
Lighting levels for broadcast use:	yes	Being confirmed by architect.
Sponsorship rights and agreements:	Yes	BMO +

## **VENUE GAPS, CHALLENGES, AND CAPITAL WORKS PROJECTS**

BMO and Big Four are ideal open space venues for consideration for the IBC and MPC facilities for the Olympic Games. The operations and existing use of the facility are focused and operated by an expert team used to dealing with large temporary builds, ensuring as a baseline, that this venue can be developed, using existing and temporary infrastructure to build out the venue to meet current Olympic Games requirements for Broadcast and Press space and operations.

The Olympic games brings a different number of users and accredited groups, protocols, security, and overall operations that are not seen in daily operations at exhibition shows or past Olympic Games. With this in mind, along with the age of the facility, there are several areas to be reviewed and considered for upgrades.

The following gaps, challenges, and capital works projects are discussed to give a complete view to the feasibility and potential requirements for additional works at this venue.

### **a. Venue Gaps**

#### **i. Space**

Current space does not meet requirements for the IBC and MPC. Further detailed studies to be completed to confirm space allocation.

### **b. Venue Challenges**

#### **i. Big Four Existing Conditions**

The Big Four venue is an older structure that will require finish updates for games use including paint, potential carpet, lighting, and HVAC to ensure Games readiness.

#### **ii. Services Separation**

Media services (Main Street) and dining services may require IBC or MPC users to go to a separate structure to get to required services. Further detailed studies in the next phase of



planning to confirm services location and access.

**iii. Parking**

Lack of required parking adjacent to both the BMO and Big Four venues for media parking, transportation to be further studied to determine options.

**c. Capital Works Projects**

As an existing venue, specific areas need to be reviewed to determine if upgrades will be necessary to meet Games requirements. The following items have been reviewed by Gibbs Gage Architects, to confirm current conditions and provide recommendations for upgrades to meet Olympic requirements.

**i. Electrical and Lighting**

- 1) General Lighting Conditions
- 2) Power – Domestic and Technical Current Conditions
- 3) Toilet Facilities Conditions including Code Compliance, Family, and Accessible Requirements
- 4) Concessions Capacity and Conditions

**ii. Roof Loads and Capacities**

- 1) Current Roof Loads and Overall Capacities
- 2) Ceiling Heights

**iii. Mechanical Systems**

- 1) Current Conditions and Capacities of the HVAC System
- 2) Current Humidity Control Conditions
- 3) Water and Sanitary Load Capacities

[REDACTED]

[REDACTED]

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**APPENDIX B: STAMPEDE PARK: IBC/MPC - BMO + BIG****4—SCOPE OF WORK**

The BMO Centre at Stampede Park is the proposed location for the International Broadcast Centre (IBP) and Main Press Centre (MPC) (IPC/MPC). We understand that the Stampede is looking to expand the BMO Centre, this study assumes that the BMO Centre expansion is NOT complete for the 2026 Olympic Winter Games. The goal of this study is to confirm if the BMO Centre, along with the Big 4 will meet the needs of the IPC/MPC and if any additional capital improvements will be required.

**Deliverables:**

- Text document describing the anticipated capital improvements (including square footages). Also include text on the building engineering including roof load capacity, mechanical HVAC description, plumbing and electrical capacities.
- Text document outlining temporary works that will need to be completed on the site (that would be considered capital costs) as well as remediation measures that will need to be undertaken post games.
- It is not anticipated any drawings will be required.

*Deliverables as required to complete a Level 5 costing exercise.*

**Format of Deliverables:**

- The CBEC team will ensure that credit is given to all work completed by architectural and engineering professionals; however, information needs to be provided to CBEC in a 'raw' form as it will be included within an overall report that will require a consistent look.
- Text documents should be provided in WORD.

**Below is a summary of the key requirements and areas to be assessed:****Required Area:**

- IBC venue to be approximately 43,000 square meters gross, with a minimum net of at least 35,000 square meters.



- MPC Venue to be approximately 20,000 square meters.
- Provide areas of main floor exhibit spaces (Exhibit A, Exhibit B, Exhibit C, Exhibit D, Exhibit E, & Palomino Room) + Main floor of Big 4
- Daily Briefing - space required for 500 seats with podium and A/V equipment for daily media briefings. - The Boyce theatre has a 500 seat capacity. This could be ideal.
- Provide area of kitchen spaces. MPC asks for kitchen and dining space. Could the existing commissary work? Is there a kitchen within the BMO?

**Base Requirements:**

- General air conditioning and heating for office use.
- Access to domestic and technical power.
- Existing floor space - **finish to be concrete with carpet**. Provide square foot area that is currently not carpet and will need to be finished with carpet.
- Ceiling height - **minimum 9 meters clear**.

**HVAC & Sound Requirements:**

- Humidity control between 40%-50% relative humidity (CBEC to confirm if lower would be acceptable given our climate).
- Temperature between 19-23 degrees C. Operating at less than 35 dB(a)
- **Guarantee the following acceptable noise levels inside the building (regardless of noise origin): 35 dB(a), 50 dBC and NR-30**

**Electrical, Lighting & A/V:**

- Lighting: General lighting should be a minimum of 400 lux.
- Power is to be supplied from the grid with full redundancy (e.g. main and synchronized Backup Medium Voltage power coming from geographically independent substations with diverse cabling and automatic sub-second transfer switching).
- Minimum power capacity of 15 MW for the IBC with a net of 9 MW available for Broadcaster use.
- Full power for the broadcast loads, including power for HVAC, to be locally backed up by standby twinpack generators to be arranged by the Organizing Committee. Generators and interconnection switchgear sets will be able and configured for automatic and manual

synchronized engagement and disengagement with the grid power. All medium to low voltage transformers will be available with N+1 redundancy. By-passable isolation transformers are required for all the technical power distribution.

- Confirm access to fibre connections

**Plumbing:**

- Provide a washroom count and occupancy calculation based on washrooms (using office requirements).

**Other:**

- Description to clean up the Big 4 - paint, carpet, etc. That can be used for level 5 cost estimate.

# **FULL VENUE REPORT:**

## **BMO Centre and Big Four Building**

Architectural (Lead): Gibbs Gage Architects

Cost Consultants: Altus Group

CBEC: IBC/MPC Feasibility Study



GIBBS GAGE ARCHITECTS

# IBC/MPC

INTERNATIONAL BROADCAST CENTRE AND MEDIA PRESS CENTRE

CBEC

APRIL 06, 2017 | 17014





ENTUITIVE



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# TERMS OF REFERENCE

## INTRODUCTION

The BMO Centre at Stampede Park is a series of 5 large halls and a number of smaller meeting/banquet conference rooms. An assumed expansion has been drawn but no Development Permit has been applied for. The scope of this study was to review this additional expansion Hall "F" in conjunction with the existing facility including the Boyce Theatre. The intent of this report is to review the capacity for this facility to host the International Broadcast Centre (IBC) and Media Press Centre (MPC) during the 2026 Olympics. Specifically we were asked to look at the following:

- Required Area to meet 43,000 SM of gross area and a minimum net of at least 35,000 SM. An additional area of 20,000 SM is required for the MPC.
- Areas for main exhibit spaces (Hall A, B, C, D, E & Palomino Room)
- Daily briefing space for 500 seats with podium and A/V
- Kitchen Space
- The above noted space needed to be evaluated to determine how much of the space met the base requirements below:
- Air conditioned and heating for office use
- Access to domestic and technical power
- Carpeted
- Clear 9M ceiling height

The following HVAC, Acoustic, Electrical, Lighting and A/V requirements were asked to be evaluated with respect to their implications to improvements to the facility:

- Humidity control below 40%-50% RH
- Temperature between 19-23 degrees C
- Acoustic noise levels inside the building of 35dBA, 50 dBC and NR-30
- Minimum 400 lux
- Power is to be supplied from the grid with full redundancy (e.g. main and synchronized. Backup Medium Voltage power coming from geographically independent substations with diverse cabling and automatic sub-second transfer

switching).

- Minimum power capacity of 15 MW for the IBC with a net of 9 MW available for Broadcaster use.
- Full power for the broadcast loads, including power for HVAC, to be locally backed up by standby twinpack generators to be arranged by the Organizing Committee. Generators and interconnection switchgear sets will be able and configured for automatic and manual synchronized engagement and disengagement with the grid power. All medium to low voltage transformers will be available with N+1 redundancy. By-passable isolation transformers are
- required for all the technical power distribution.

The Calgary Bid Exploration Committee requested we engage the following consultants to assist in the preparation of the report and their sections are noted under separate cover:

Structural – Entuitive

Mechanical – MPE Engineering

Electrical – DesignCore Engineering

Costing – Altus Group

A site investigation was held on February 27th, with members of the consultant team and representatives from the Calgary Stampede. Drawings have since been provided by the Stampede and are listed in the Appendix. Beyond the above noted items, we were requested to review the building for potential code non-compliance and other issues that may have cost implications to the renovation to make suitable for the Olympic Games. In most of these conditions the current non-compliance can likely be grandfathered pending the scale and scope of alterations to the building.

## MODIFIED SCOPE

During the process, it became clear that there was not sufficient qualifying space in the BMO with the expansion of Hall "F" so alternative scenarios were requested to be considered and costed. An additional site visit with the CBEC project team occurred on March 15th to review potential scenarios. Those scenarios are as follows:

- Scenario 1 temporary structure adjacent to boyce

theatre of 12,400 sm

- Scenario 2 - raise roof of hall "c" and build 7,900 sm of temporary structure
- Scenario 3 - partial demolition of corral bleachers to convert to open space, raise the roof on hall "c" and build 1300 sm of temporary structure

Additional consideration for cost implications were requested by the CBEC committee that looked at the following 3 criteria:

- Capital Maintenance/Life-Cycle: Costs that are required to extend the useful life of a facility in its current configuration to a period which includes, at minimum, the expected timeframe of the 2026 OPWG.
- Olympic Requirements: Costs which are required to modify or otherwise make ready a facility to meet the Olympic requirement from either a field of play perspective or from an operational/ancillary space perspective and would only be incurred by venue operators if the Olympics were being staged at the venue.
- Additional Long-Term Legacy Enhancements: Improvements to the venue that reasonably enhance the facility from its present state/configuration and as a result, provide incremental and long term benefit to sport, venue operators, recreational users and/or the community at large - locally, provincially and nationally, and from a social, sport or economic perspective.

Given the evolution and variations in the study and test fit of the BMO facility the considerations for the above cost implications are captured in some of the scenarios described.

\*Refer to Altus Cost Report.



# EXECUTIVE SUMMARY

## TEST FIT

Requirements for the IBC and MPC were clarified during the process to indicate that the IBC is preferably contiguous space that meets the noted criteria and the MPC could be stand alone and not necessarily contiguous with the IBC space. The acoustic, lighting and HVAC considerations apply to the IBC facility.

The early indication on area indicated that both the BMO with Hall "F" for the IBC and the Big 4 for the MPC are insufficient in both the amount and quality of space for the IBC and for the MPC. As a result alternative scenarios were requested to be considered as above.

## SCENARIO 1 - TEMPORARY STRUCTURE ADJACENT TO BOYCE THEATRE OF 12,400 SM

Given the insufficient amount of full height space required of the IBC, additional structures would be required. These would be considered as temporary structures that meet the requirements identified in the Terms of Reference. The size of the temporary structure would be 12,400 SM or approximately 134,000 SF

Additional requirements of this temporary structure not identified relate to the floor loading which should be designed to be equivalent to the floor slab loading currently identified in the BMO centre and outlined in the structural portion of this report. Exterior walls would also need loading.

Washrooms, Mechanical and Electrical support spaces would be considered as located outside this shell space or covered as part of the back of house gross area of the BMO.

The location of this on the site should have a large impact on the cost but has generally been considered to be North of the Boyce Theatre on the parking apron. The building would need to be physically linked to the BMO and Boyce Theatre but it is assumed that this link could be soft wall portal with

minimal tie in to the existing structure. Given the size of this temporary structure it would likely not fit entirely in this location without impact to the Commissary building, substation, loading and access to the rest of the BMO Centre.

The attached sketch illustrates the implications of this large of a temporary structure. One of the notable challenges is the location of the substation and commissary, which would likely need to be relocated to accommodate this temporary structure. The exact relocation of both of those facilities is unknown at this time.

## SCENARIO 2 - RAISE ROOF OF HALL "C" AND BUILD 7,900 SM OF TEMPORARY STRUCTURE

To address the insufficient amount of hall space with the required clear height, the consultant team was asked to review the implications of raising the roof for Hall "C". Further description for structural solutions and implications are covered in the structural section of this report. Some of the related issues regarding the roof are the impact on adjacent snow loading. The intent would be to approximately match the height of Hall "B" so there would be no impact to that roof. The Palomino was originally designed for a 2nd floor so it has some latent roof load capacity and likely is not of concern as well.

This option has the added benefit of providing a legacy enhancement to the Stampede and seems to fit within their future plans. The higher volume throughout the BMO facility would facilitate a broader range of trade and convention possibilities.

This option is to be considered in combination with an additional 7,900 SM or 85,000 sf of temporary facility that meets the performance requirements outlined in the terms of reference and summarized in scenario 1.

The most beneficial legacy strategy would be to add internal columns on new foundations and rebuild the roof with a new structural framing system. This would create column free space which the hall is currently not. This is more costly in the short term and as such the Structural consultant has provided alternatives in the Structural Summary of the report. For the purposes of this study, the solution to rebuild the structure with new roof and perimeter columns is recommended for the best legacy for the facility.

The total hard construction costs for scenario 2 is app. **\$84,560,000.** \*Refer to Altus Cost Report.

### **SCENARIO 3 - PARTIAL DEMOLITION OF CORRAL BLEACHERS TO CONVERT TO OPEN SPACE, RAISE THE ROOF ON HALL "C" AND BUILD 1300 SM OF TEMPORARY STRUCTURE**

Another option considered to address the shortfall of 9M high space is to include the Corral Centre in the IBC facilities, thereby reducing the temporary structures down to 1300 SM or 14,000 SF.

In order to create as much usable space in the Corral and knowing that the Corral is an aging structure that does not necessarily fit with the long term vision of Stampede Park, a partial demolition of the seating bowl is suggested. This assumes the Corral is still a facility that is operational in 9 years and that a partial demolition is feasible.

In order to facilitate this a new slab would need to be created as the refrigerated slab would need to be removed and replaced with the appropriate loading capacity comparable to the BMO Centre. There are some areas such as the current locker rooms that below the main floor elevation which would need to be void filled to accommodate the new slab as well

Access loading doors currently exist at grade for the building and would be retained

The structural implications of removing the concrete bleachers mean the columns would need to laterally braced.

It is assumed that the functional support spaces would remain, specifically the washrooms, back of house and concession spaces.

The mechanical systems are mounted on the roof and could be re-purposed to meet the requirements for HVAC temperature control.

for the demolition of the seating bowl for the corral centre noted in a separate report for the corral centre.

\*Refer to Altus Cost Report.

### **BOYCE THEATRE**

The Boyce Theatre is ideally suited to host the daily meeting briefings and requires little improvement or upgrades to suit. An elevator to provide barrier free access is recommended. Minor improvements to make the venue suitable for use to the Games has been considered and factored into each scenario.

### **BIG 4**

As the venue for the Media Press Centre, the Big 4 is insufficient in space but this deficiency has been noted to be addressed by a temporary tent structure. This tent structure would supplement the app. 120,000 sf net space available and the cost of the temporary structure is not considered in the cost summary. Minor improvements to make the venue suitable for use to the Games has been considered and factored into each scenario.



# ARCHITECTURAL SUMMARY

## NET AREA BMO-IBC

Halls A, B and C are part of the original facility and directly connected to each other. The height of Halls A and C are 21'0" or 6.4M in height and do not meet the clear height requirements. Hall "C" is 29'0" and 8.9M. Hall "D" is 29'9" or 9M while hall "E" and the proposed hall "F" are and would be 35'0" or 10.6M clear. This results in xxx SM of space that meets the criteria for high volume open hall space. All of the large halls A, B, C, D, E, F would require carpeting as they are currently concrete flooring. This equates to 200,000 sf or 18,580 sm of space that meets the requirements identified. An additional 100,000 sf or 9,300 sm of space that is lower than required

## GROSS AREA BMO-IBC

There is a significant amount of area in other portions of the facility that could be considered part of the usable area and not dedicated to loading bays, circulation or mechanical/electrical support space. The following chart indicates the various areas that could be fit up as part of the requirement for the IBC. (Refer to the attached spreadsheet and plans for the specific areas)

### Acoustic Criteria

The main halls were tested during a walkthrough and registered at app. 60 dBA in all of the halls. To achieve the desire sound levels, replacement of lighting with LED and remote ballasts would be required throughout the facility. Dampers and insulation on mechanical equipment would need to be added as well as acoustic wall panels are all hard surfaces and likely additional ceiling baffles would be required throughout. An allowance was made for this work at this point as further testing by an acoustical engineer would be required to determine the amount and type of improvements.

### Kitchen/Food Prep Facilities

There are 2 main food preparation areas located in the BMO. They are not currently used as cooking facilities but rather as server support areas. One is located adjacent to the Palomino Hall at 360 SM (3,900sf) and the other is located East of Hall "D" at 860 M (9,200sf). Food is prepared in the separate Commissary Building for most functions at the BMO facility.

## Boyce Theatre

The Boyce theatre is a dedicated theatre located adjacent to the Corral centre and accommodates 500 seating capacity. There is a 60 foot or 18.2 M wide by 20 foot or 6 M deep stage and separate loading bays. Behind the stage is an additional loading area of 20 foot or 6 M deep area for loading and back of house. It is connected to the loading and back of house for Hall "A". It is connected directly to the Corral Centre in the front of house/foyer. The upper level has no barrier free access and an elevator would be required to provide access to the upper level. The lower level has barrier free seating.

Washroom facilities are located on the upper floor and lower floor to suit the 500 seating capacity. All of the washrooms do not currently meet the requirements for barrier free access and would need to be upgraded to suit use of the venue for press briefings. Green rooms are located off of the main hall foyer. The upper floor features enough space for media/camera/audio and visual requirements

If the Corral is to be used as a venue for Ice Hockey, one of the required exits is through the Boyce Theatre lobby and would need to be maintained unless a renovated solution is possible for the Corral exiting requirements.

The theatre seating is currently non-compliant specifically in 2 areas that likely could be negotiated to be grandfathered for use during the Games.

- Seating- the rows currently exceed the maximum number in rows with fixed seats and access to aisles.
- Dead end Corridors – the upper floor has a dead end corridor on the west side that exceeds the maximum distance of 3M.

The theatre is in very good condition and would not require any improvements from an aesthetic or performance criteria.

## Big 4-MPC test fit

The Big 4 facility is contemplated for hosting the Media Press Centre for the 2026 Olympics. The building consists of 2 floors of 60,000 sf or 11,150 sm of open space. There is support space that is useable area and not part of building operations,



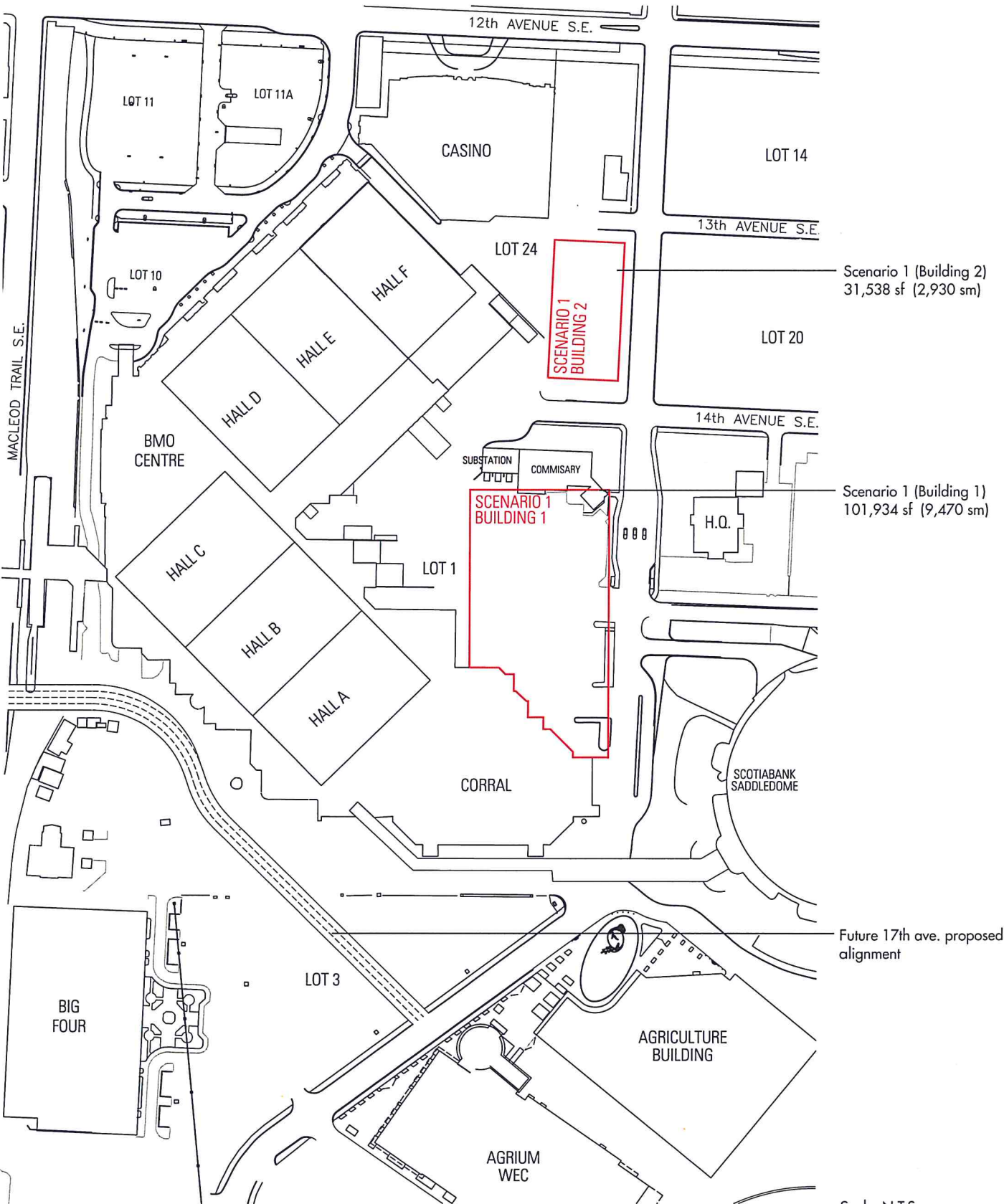
loading or dedicated Stampede Security space. The 2nd floor includes some multi-purpose rooms as well as a restaurant (Mavericks) with a full service kitchen.

While the building is fully accessible and may be grandfathered where it is not compliant with current codes it should be noted that the washrooms do not meet barrier free requirements and there is only one elevator in the building. However a Universal washroom has been provided on the upper level washrooms and would meet the intent for this floor area in a renovation condition.

There is currently 52 female washrooms and 37 male in the facility accessible to the public located on the mezzanines, main and second floors. This equates to an occupancy of 8600 for the facility. There is additional washrooms that can be accessed from the exterior on the East side of the building.

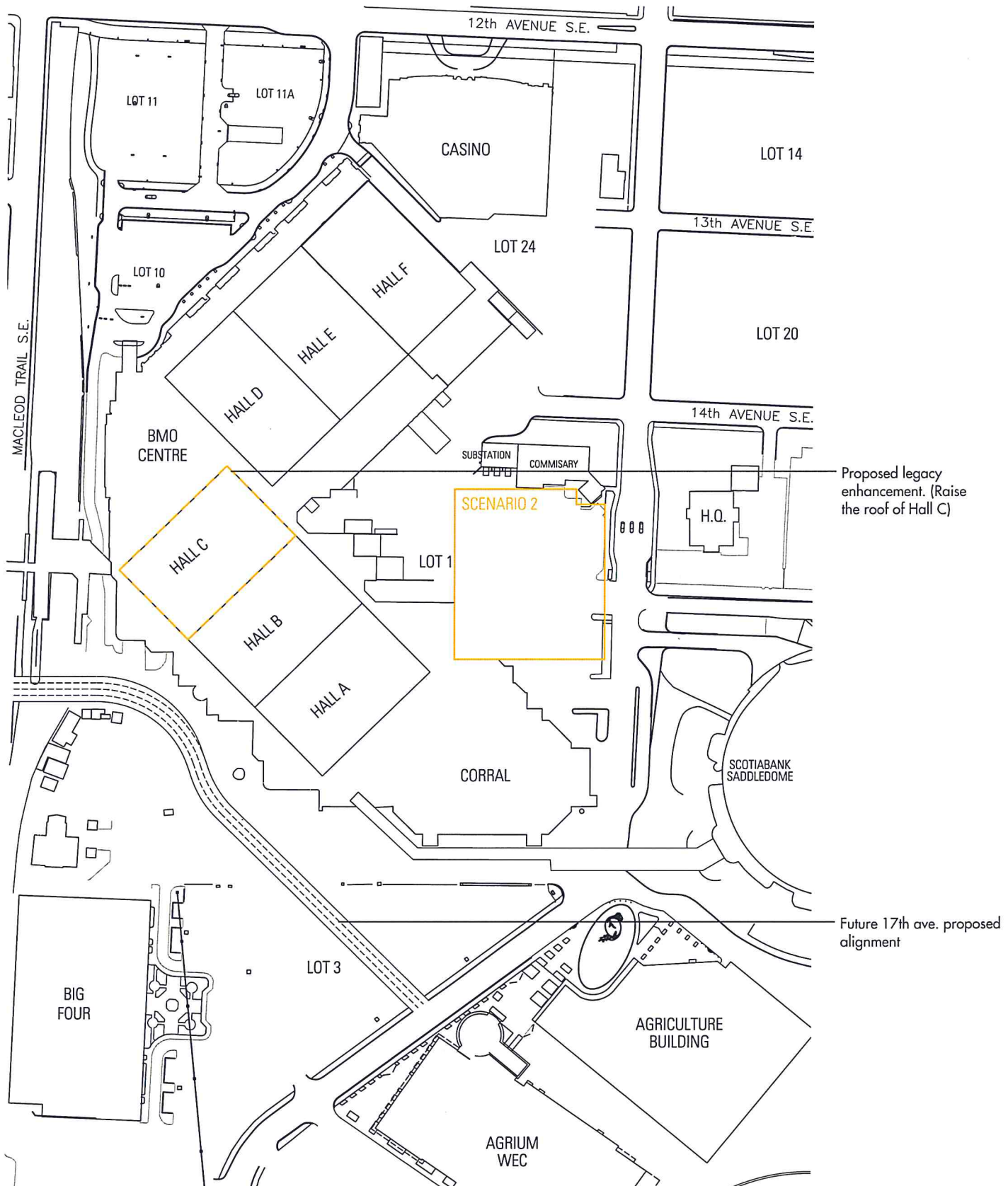
Additional considerations for the location of the MPC in the Big 4 building are specific to security and sound attenuation. The Big 4 is located directly adjacent to the Light Rail Transit Red line on the west wall. The west side of the Big 4 houses the loading ramps, mechanical support spaces and some washroom facilities. Nonetheless, the west exterior wall is also the crash wall of the LRT line. This is an issue for the transmission of noise and the security of the facility that is beyond the scope of this report

# SCENARIO 1



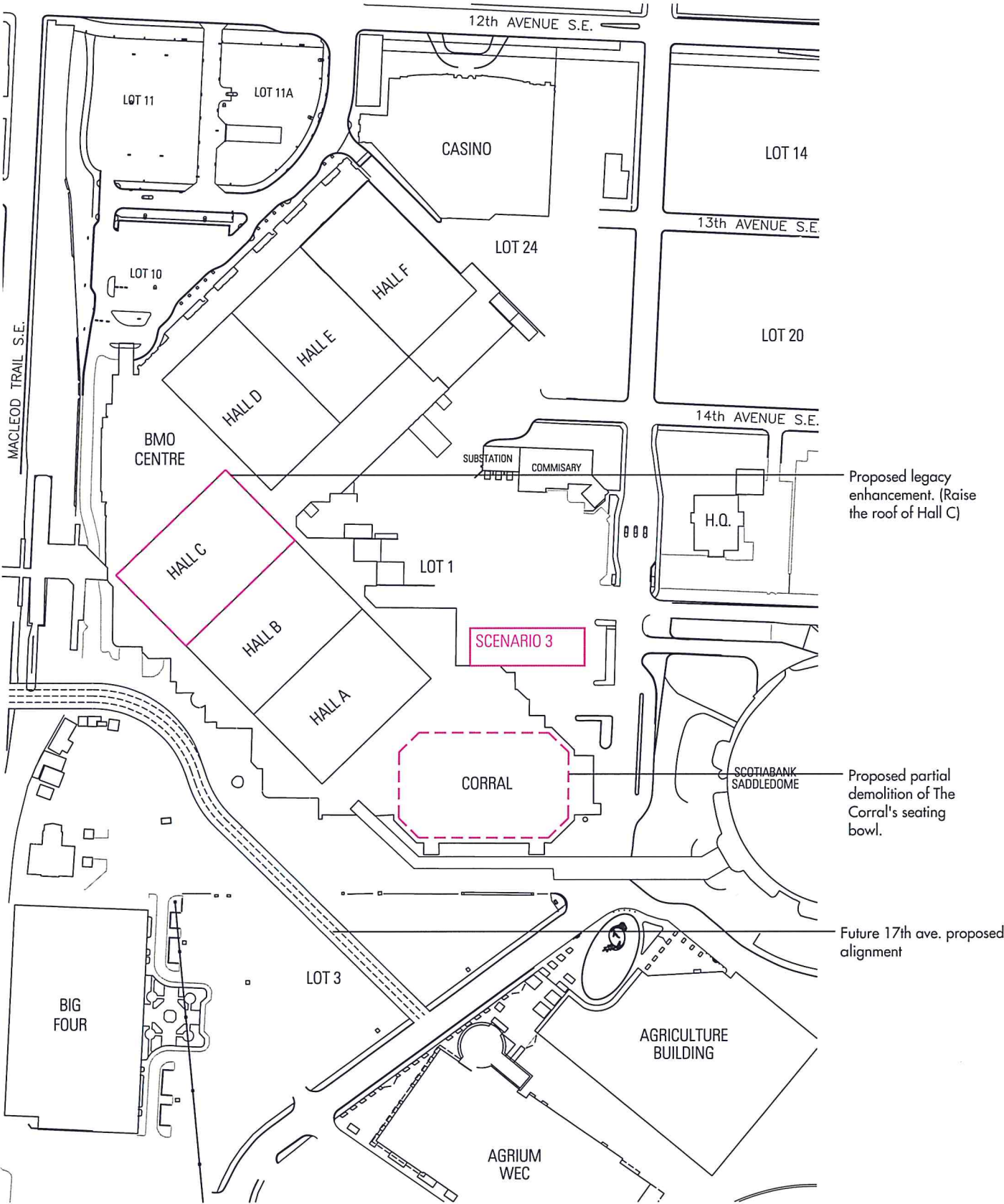
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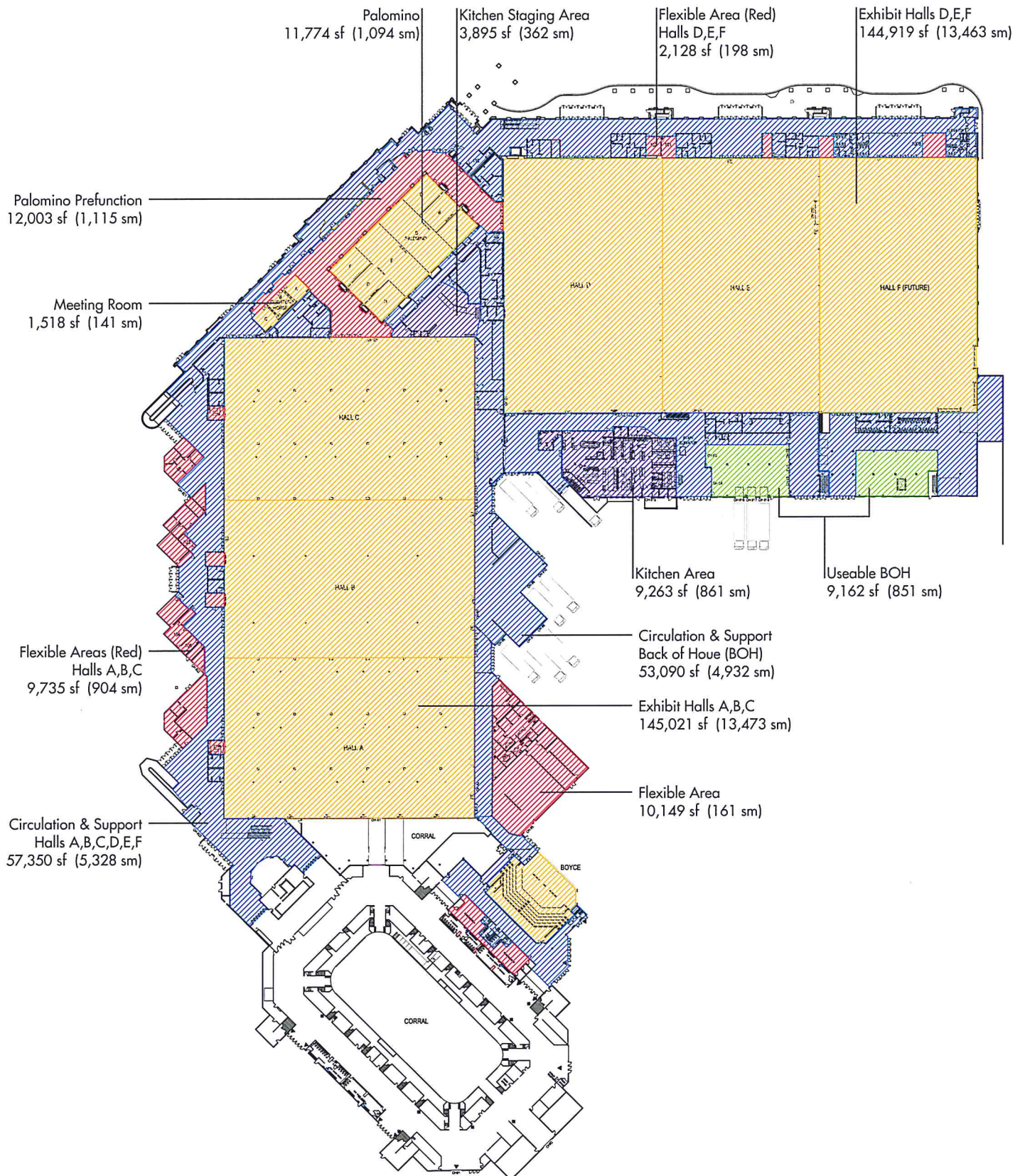
# SCENARIO 2



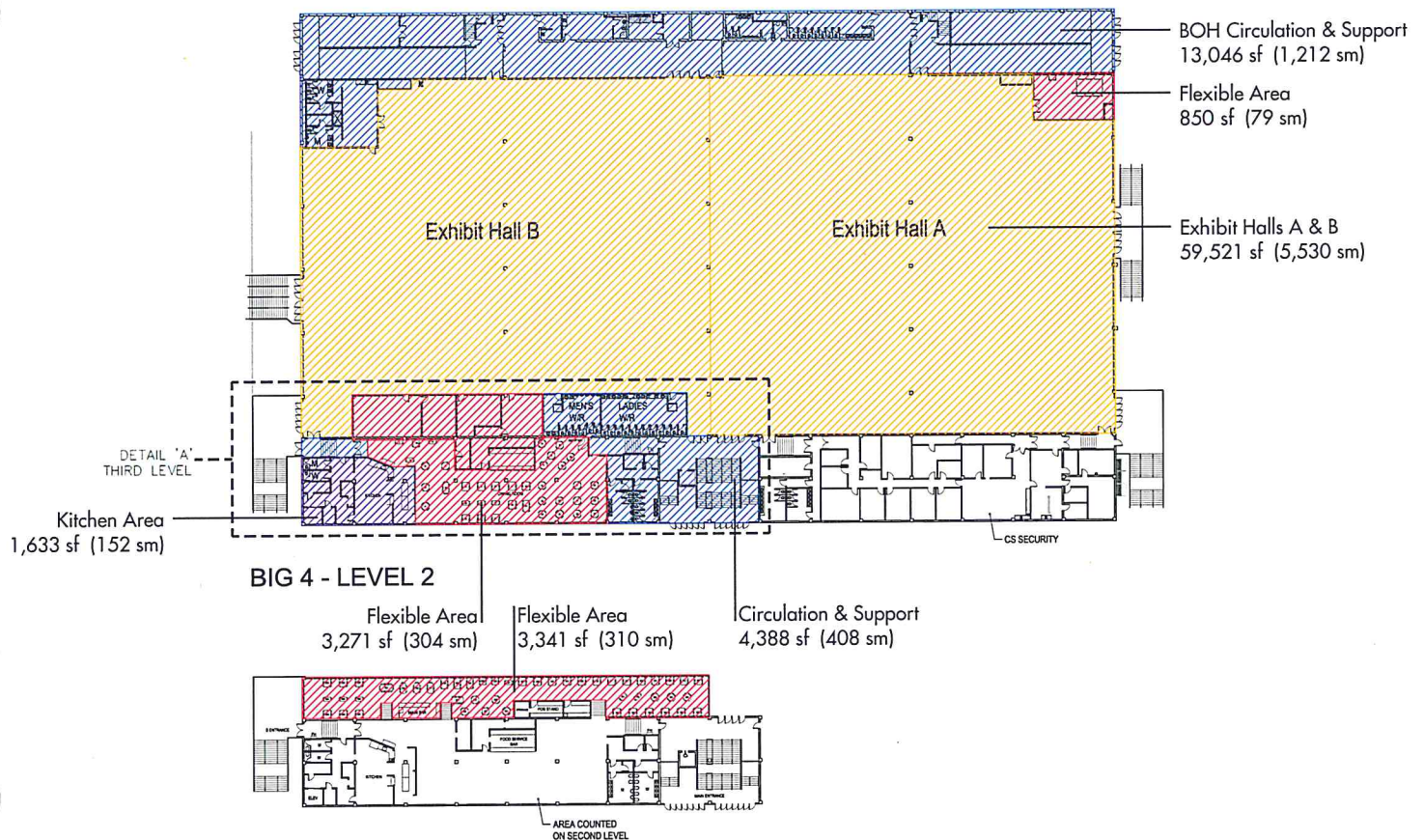
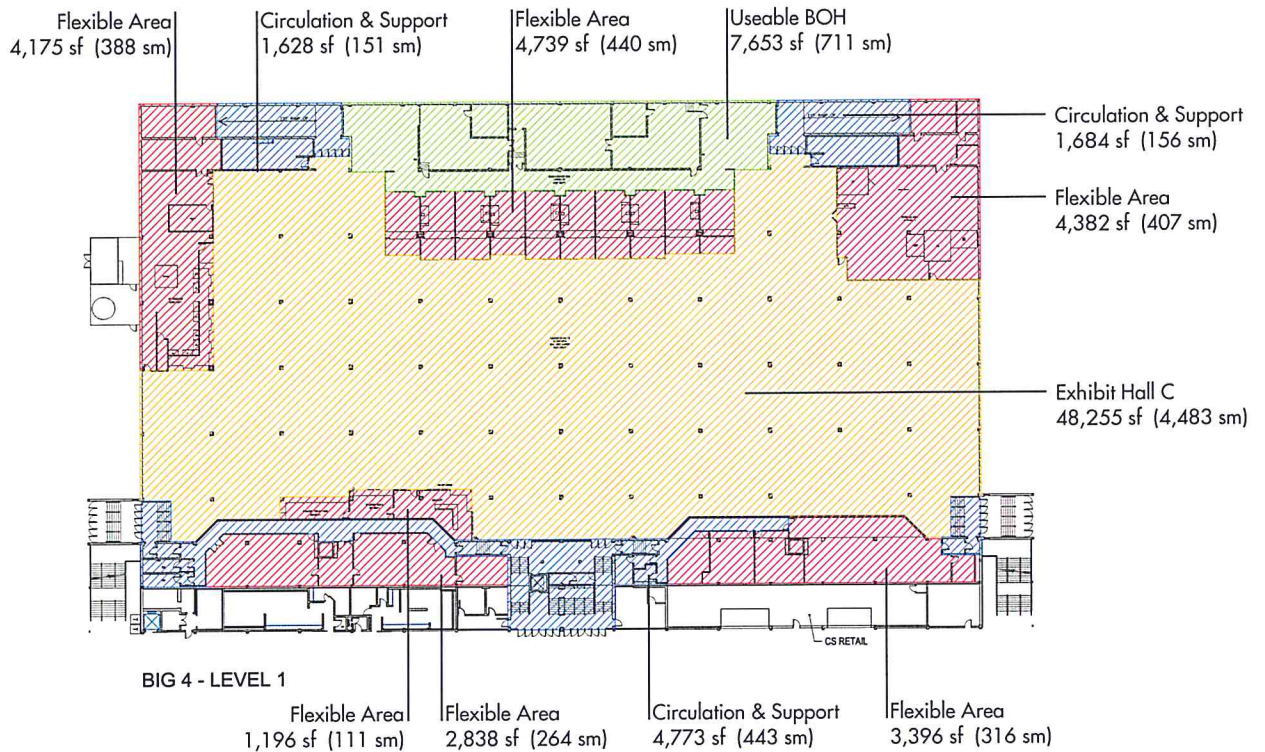


# SCENARIO 3









DETAIL "A" - LEVEL 3





# STRUCTURAL SUMMARY

## INTRODUCTION

The BMO Centre and Big 4 buildings located on the Calgary Stampede grounds are good candidates for broadcast operations from a structural perspective. Each building houses large open flexible spaces with high floor load capacity and extra roof load capacity which allows for rigging and suspended loads from the structure.

Entuitive has undertaken a review of the existing building drawing packages made available to us for this exercise and have found the following for each building:

### BMO Centre:

The main floor, exhibition hall slabs of the BMO centre are designed for heavy floor loading as is required by large multifunction convention halls. The design loads throughout the building vary from 4.8kPa (100psf) to 12kPa (250 psf) both of which would be generally adequate for the broadcasting functions being considered. Areas of high load concentration would be subject to further review for impact on the base building structure and possible relocation/distribution of equipment. We expect these areas to be minimal.

Each of the 5 halls has rigging load allowances designed into the roof structure. These are laid out in the form of rigging plans for each of the five halls. Refer to appendix A for these rigging plans. While the exact loading criteria for the broadcast centre are not known, the allowances are generous and would presumably be adequate for the usage and could be supplemented by secondary floor supporting temporary structures if necessary.

### Raising the Roof on Hall "C"

Two general options present themselves for increasing the clear height within Halls A and C.

A) The first option is to demolish the existing structure

and replace it with a similar roof structure, or a new roof with improved clear spans.

- If the existing columns framing is maintained, the existing design of the roof could be re-created on taller columns. This would have a minimal impact on the existing foundations on the interior of the hall.
- Creating an entirely new roof with a clear span roof structure similar to that of Halls, B, D or E would be possible with the introduction of new foundations on a new grid line within the existing footprint of Halls A and C. With the exception of a double column line being introduced at the transition with Hall B this would create a much more flexible halls space.

B) The second option is to lift the existing roof structure in-situ. The northern and southern bays of framing would be demolished and re-constructed at the higher elevation on new beam lines at the corrected elevation. The interior framing could be lifted off of the existing interior columns using a series of jacking frames surrounding each existing column. The columns would then either be lengthened through the use of steel framing or replaced with new longer columns. The jacking process must be undertaken for all columns in unison.

In both options A and B described above, the perimeter wall braced bays may require upgrading to accommodate the increased lateral loading of the higher roof and increased building volume. These upgrades would encompass the bracing and columns but also potentially the foundations. A detailed review of the existing foundation and structural plans (not currently available) would be required to determine the extent of these upgrades.

Adjacent roof areas to halls A and C may require upgrades to accommodate increased snow shadowing, and the cladding for the high roof wall of halls A and C would require replacement.

In each option, temporary stabilization of the Hall B roof framing may be required in the East West direction due to the temporary uncoupling of the connections to the Halls A and C roofs.

#### Big 4:

The Big 4 building has two multifunction levels. Original drawings were not made available to us for this building and as such we cannot comment on its floor load capacities however through its use an occupancy through its life the building has effectively supported exhibition hall loading throughout its life and the floors are likely capable of supporting 4.8kPa (100psf) occupancy live loads.

The basement level has relatively low ceiling heights and closely spaced columns for support of the primary exhibition hall above. We do not expect that the underside of the main level is capable of supporting significant rigging loads due to the need for the structure to carry the high live load requirements of the hall above. The headroom in the basement is such that suspended equipment may not be practical.

The main level exhibition hall has similar clear height to the BMO centre with additional roof loading allowances for rigging. These are outlined in Appendix B.

#### Corral Centre -Demolition of Seating Bowl (Prepared by RJC as part of Corral Centre Study)

The seating bowl is constructed from cast-in-place concrete slabs supported on rakers spanning from the upper to lower concourse. No structural drawings of the seating bowl have been provided; however, it is our understanding the rakers provide lateral support to the upper concourse level and steel roof columns. With the understanding the upper concourse is to remain, it is feasible to demolish the existing seating and rakers to create an open flat event floor. The following structural modifications are required to demolish the seating area:

- Introduce vertical steel brace elements between the upper and lower concourse level, at an approximate spacing of 24m on centre (12 in total). The assumed width of the new vertical steel brace is 4 meters. Based on this assumption, the assumed weight for each vertical steel brace is approximately 6000 kg. It is feasible to make use of the existing concrete columns as part of the new brace element, however, further investigation would be required.
  - Install a new foundation system to support the design loads from the new brace elements. This would most likely be a micro-piles system; however, further investigation with guidance from a geotechnical engineer is required
- Introduce a new lateral diaphragm at the upper concourse level. This could be achieved by either a new 3.5m wide by 200mm deep reinforced concrete slab cast on top of the exiting concourse level or a 4 meter deep horizontal steel truss supported from the upper concourse level. Either options, the 200mm concrete slab or the horizontal steel truss would in-circle the existing upper concourse level. Based on the assumption of a 4m deep truss, the assumed weight of the new horizontal steel truss would be approximately 335kg per linear meter of upper concourse level.



# MECHANICAL SUMMARY

## INTRODUCTION

The BMO Centre and Big 4 Building are being considered as the location for both the International Broadcast Centre (IBC) and Main Press Centre (MPC) for the 2026 Olympic Winter Games. This study assumes that the contemplated BMO Centre expansion (Hall 'F') will be completed prior to the Games and available for use.

For the purposes of this study, all new mechanical systems being proposed for the expansion will be treated as existing. The BMO Centre includes the Corral, Round-Up Centre and Boyce Theater.

The refrigeration system for the Corral ice plant is considered to be outside the scope of this analysis.

The mechanical systems have been analyzed based on the following design criteria:

- Indoor Environmental Conditions (Temperature and Humidity);
- High-level acoustical performance commentary;
- HVAC System Capacities (Heating, Ventilation and Air-Conditioning), and,
- Plumbing Systems and Infrastructure.

The information provided in this study is based on the drawings (new and existing) provided as well as discussions with the building operations staff.

## BACKGROUND

### Existing HVAC Systems

A brief summary of the HVAC systems for each facility is provided as follows:

BMO Centre (Including Round-Up Centre, Boyce Theater, Corral)

Perimeter hydronic heating is generally provided throughout the facility. Airflow for supplemental heating,

ventilation and air-conditioning is provided by rooftop units (RTU's) located throughout the facility. The bulk of the RTU's are indirect gas-fired units with no humidification capabilities, though the units for the Palomino and "front of house" areas are hydronic heating complete with dedicated humidification systems. Cooling for the RTU's is provided by direct expansion (DX) cooling coils with on-board condensing units.

Make-up air (100% outside air) is provided for areas such as the loading docks and service areas by direct gas-fired (heating only), rooftop make-up air units (MUA's).

Hydronic unit heaters are located throughout the facility and provide a base level of building heating during unoccupied hours; these units are fed with heated glycol from the building heating system.

The building systems are generally in good condition with several RTU's having been replaced within the last five (5) years. The Boyce Theater and Hall A and B RTU's are the exception to this comment and are at or near the end of their useful life expectancy.

### Big 4 Building

Central heating is provided by a central steam system consisting of by two (2) boilers. Steam is converted to glycol by a series of converters for general building heating purposes. Chilled water for cooling is provided by two (2) chillers complete with an outdoor cooling tower.

Perimeter hydronic heating is generally provided throughout the facility. Airflow for supplemental heating, ventilation and air-conditioning is provided by indoor air handling units (AHU's) located in the main mechanical room. The AHU's contain glycol heating coils and chilled water cooling coils. The AHU's are not equipped with humidification capabilities.

The building systems are generally in good condition with most major infrastructure (boilers and chillers) having been replaced after the damage caused by the 2013 flood. The building's AHU's were not replaced after the flood, though they are in good working condition.

## Existing Washroom Fixtures

The existing washroom groups are generally distributed throughout the BMO and Big 4 facilities. It is assumed that the washroom fixture count is sufficient based on the current occupant load for each facility.

## Olympic Design Requirements

The requirements provided by the CBEC have been analyzed for the purpose of determining their applicability to the existing mechanical systems and infrastructure. The following is a summary of the key requirements identified that have mechanical implications:

### Indoor Temperature:

Heating and cooling systems are to be provided to maintain an indoor temperature of 19°C to 23 °C.

### Indoor Relative Humidity:

Indoor relative humidity levels are to be maintained between 40% to 50%. Of note, subsequent discussions have taken place with the CBEC and the 40% to 50% range has been confirmed as a maximum limit. Indoor relative humidity levels during winter months are typically lowered to between 20% to 30% in order to prevent condensation on external glazing areas.

Of additional note, maintaining adequate internal relative humidity minimums could be a challenge as opposed to not exceeding prescribed humidity maximums. Minimum humidity levels are often required in order to promote effective operation of electronic equipment. It is expected that there will be sufficient internal humidity gain from the building occupants (latent load) to ensure that sufficient relative humidity minimums are maintained.

### Noise Levels:

Noise levels must be maintained below the levels of 35dB(a), 50dB(c) and NR-30. As noted in the architectural summary a noise rating (NR) value of 30 is generally applicable for theaters, cinemas and conference space functions; this is an aggressive target for what is currently an assembly hall occupancy.

### Occupant / Equipment Density:

Occupant density may be increased based on the revised temporary space usage for the Olympics. The addition of people and equipment (computers, cameras, studio lighting, etc.) could also increase the

amount of internal heat gain considerably and have air-conditioning capacity implications.

## Mechanical Systems Analysis and Conclusions

A summary of the analysis for each facility is provided based on the Olympic Design Requirements as well as the potential increase in occupant density.

### BMO Centre:

#### Indoor Temperature:

The existing heating and cooling systems are deemed capable of meeting the required indoor temperature range.

#### Indoor Relative Humidity:

The existing HVAC systems are deemed capable of not exceeding the prescribed maximum relative humidity levels for winter operation.

#### Noise Levels:

The acoustic performance of the existing air handling systems is not known, however it is likely that the existing mechanical systems would not comply with the acoustical requirements and associated noise limits. Good design practice for assembly facilities such as the BMO Centre would likely be based on an NR value of between 40 and 50. A detailed acoustic study is recommended in order to determine the performance of the mechanical systems as they are currently installed. If the systems are found to exceed the recommended levels, the effect of various acoustic treatments can be vetted and potentially implemented.

#### Occupant / Equipment Density:

The current occupancy density for the BMO Centre is likely sufficient for the Olympic requirements. Should the occupant density be increased beyond its current level, a review of the plumbing fixture count and outside air for building occupants would be required to ensure that the existing systems and infrastructure are capable of providing sufficient capacity required by code. A significant increase in occupant density could also require additional air-conditioning capacity as a result of the increase in space heat gain from the additional occupants.

Further detail as to the potential heat gain from the equipment related to the temporary space usage



is required in order to determine if supplemental air-conditioning capacity is required or if sufficient residual capacity exists within the current air-conditioning systems.

#### Big 4 Building:

##### Indoor Temperature:

The existing heating and cooling systems are deemed capable of meeting the required indoor temperature range.

##### Indoor Relative Humidity:

The existing HVAC systems are deemed capable of not exceeding the prescribed maximum relative humidity levels for winter operation.

##### Noise Levels:

The acoustic performance of the existing air handling systems is not known, however it is likely that the existing mechanical systems would not comply with the acoustical requirements and associated noise limits. Good design practice for assembly facilities such as the Big 4 Building would likely be based on an NR value of between 40 and 50. A detailed acoustic study is recommended in order to determine the performance of the mechanical systems as they are currently installed. If the systems are found to exceed the recommended levels, the effect of various acoustic treatments can be vetted and potentially implemented.

##### Occupant / Equipment Density:

The current occupancy density for the Big 4 Building is likely sufficient for the Olympic requirements. Should the occupant density be increased beyond its current level, a review of the plumbing fixture count and outside air for building occupants would be required to ensure that the existing systems and infrastructure are capable of providing sufficient code-required capacity. A significant increase in occupant density could also require additional air-conditioning capacity as a result of the increase in space heat gain from the additional occupants.

Further detail as to the potential heat gain from the equipment related to the temporary space usage is required in order to determine if supplemental air-conditioning capacity is required or if sufficient residual capacity exists within the current air-conditioning systems.



# ELECTRICAL SUMMARY

## INTRODUCTION

Designcore Engineering Ltd. has been retained to review the existing electrical, lighting and telecommunications systems and to evaluate the ability to upgrade with respect to hosting the International Broadcasting Centre for the Winter Olympics at the BMO Centre at Stampede Park. Designcore has performed an on-site review of the existing systems and upgrade potential of the following: power capacity, power redundancy, lighting systems and communications infrastructure including fibre services to the building. Attached to this report are a series of sketches indicating existing power and communications infrastructure.

## EXISTING POWER CAPACITIES

### Substation

The Calgary Exhibition & Stampede (CE&S) substation is supplied by two (2) 25kV feeders from Enmax Substations which operate in a Preferred-Alternate arrangement with CE&S fail-over auto-transfer capability. The two feeders have the capability of being fed from two different substations

Each feeder, Preferred and Alternate, support other utility customers. The utility, Enmax, has been contacted for further information, however when asked what the capacity for the Stampede feeder is, both Preferred and Alternate, they replied with "This information is not available to customers".

We would like to recommend a meeting between the committee co-chairs and senior personnel at Enmax take place and see if this information could be made available.

Three (3) 25 kV–4.16 kV 14 MVA rated power CE&S transformers are installed which feed sections of a 5 kV switchgear line-up. Each section of 5 kV switchgear is rated for 2,000 amps at 4,160 Volts 3-phase. Each section of switchgear has a tie breaker connecting it to the section adjacent to it. These tie breakers are automatic and will close as soon as the main feeder breaker opens in the event of a failure. The entire system is designed for an N+1 configuration with a total of 28 MVA available with one redundant 14 MVA transformer.

### BMO Centre

The existing electrical service for the BMO Centre is sourced at the Stampede Substation. The BMO Centre is supported on a 5 kV ring feeder along with the Corral with the supply ends sourced at two different sections of the 5 kV Switchgear located in the substation which provides a fully redundant electrical supply.

The BMO Centre Halls A, B and C low voltage distribution is comprised of two (2) redundant 347/600 volt 3-phase 2,000A services fed from individual 1,500 kVA ANIN / 2,000 kVA AFN power transformers. The main board is a double ended 2,000A switchboard utilizing a manual tie breaker.

The BMO Centre Hall D and E low voltage distribution is comprised of two (2) redundant 347/600 volt 3-phase 3,000A services fed from individual 2,000 kVA transformers. The main board is a double ended 3,000A switchboard utilizing a manual tie breaker.

This system currently allows for 6.0 MVA of redundant power or 12.0 MVA of total non-redundant power.

## POWER CAPACITY UPGRADES

### Substation

To meet the utility supply redundancy requirements as listed in the Standing Offer Scope of Work document, a new 25 kV feeder would be required to be installed from an independent ENMAX substation to the Stampede Park to ensure the Preferred and Alternate feeds are sourced at different utility substations.

The CE&S substation has the capacity to accommodate the required 24 MVA of connected load for the International Broadcasting Centre.

There will be a requirement to take a holistic view of the type and timing of the activities that will occur on Stampede Park. This report focuses on the BMO / Big Four Building and the requirements for these facilities only. The substation can accommodate the electrical requirements for the BMO / Big Four however the substation may not be able to accommodate the IBC based on other events that may be occurring at the same time on Stampede Park.

## BMO Centre

The 5 kV distribution system has the capacity to be upgraded to allow for the projected 24 MVA of power required at the BMO Centre. Additional feeders are required as are revisions in the 5 kV Switchgear.

### Necessary Upgrades to Accommodate Backup Requirements

The requirements for a redundant on-site generation system can be accommodated at the BMO Centre. There is sufficient space in the adjacent parking area to locate any generators that are required. To accomplish this, there will need to be temporary power cables installed to tie in the backup system to the main systems.

The most effective way to accomplish this interconnect will be to source generators which operate at 5 kV and connect to the 5 kV infrastructure. The connection from the generators located in the parking area to the BMO Centre would be through the underground duct bank system. All synchronizing equipment, etc. will be part of the temporary generation system.

### Existing Lighting System

The existing lighting system within the BMO Centre provides the required general lighting level of 400 lux for the International Broadcasting Centre.

### Lighting System Upgrades

At this time, there are no recommended upgrades to the lighting systems to accommodate general lighting.

### Existing Communications Infrastructure

The BMO Centre houses the main Park demarcation room designated 'SL1' which includes the following incoming fibre counts:

- Telus 48 strands (48 used)
- City of Calgary 48 strands (4 used)
- Bell 24 strands (18 used)
- Allstream 48 strands (2 used)
- Shaw fibre gateway to Saddledome

### Communication Infrastructure Upgrades

Additional underground ducts and the installation of new underground vaults that would tie into the existing underground duct bank network would be necessary to ensure redundant fibre pathways are arranged to ensure there are no single points of failure.

## Boyce Theatre

### Existing Power

Currently the Boyce Theater is fed from two independent sources.

- One (1) - 100 amp, 120/208 volt 3 phase 4 wire show panel is located on stage right. The panel is fed from Hall A of the BMO Centre.
- One (1) - 100 amp, 347/600 volt, 3 phase 4 wire fused disconnect is located on stage right. This disconnect is fed from the BMO Centre.
- One (1) - 200 amp 120/208 volt, 3 phase 4 wire panel is located on the upper level behind the seating area.

### Power Capacity Upgrades

Depending on the use of the Boyce Theatre, additional power would be required.

### Existing Lighting System

The existing lighting in the seating area is comprised of fluorescent luminaires and incandescent pot lights.

The stage lighting utilizes incandescent high bay luminaires.

### Lighting System Upgrades

A complete lighting modernization upgrade would be required including:

- New luminaires throughout the seating area.
- New luminaries on the stage.
- New lighting control system.

### Existing Communications Infrastructure

The existing telecommunications utilizes Cat 5e cabling to minimal data jacks within the facility.

### Communication Infrastructure Upgrades

Depending on the use of the Boyce Theatre additional data jacks and fibre optic cabling would be required.

## Big Four Building

### Existing Power Capacities

### Substation

The Calgary Exhibition & Stampede (CE&S) substation is supplied by two (2) 25kV feeders from Enmax



Substations which operate in a Preferred-Alternate arrangement with CE&S fail-over auto-transfer capability. The two feeders have the capability of being fed from two different substations

Each feeder, Preferred and Alternate, support other utility customers. The utility, Enmax, has been contacted for further information, however when asked what the capacity for the Stampede feeder is, both Preferred and Alternate, they replied with "This information is not available to customers".

We would like to recommend a meeting between the committee co-chairs and senior personnel at Enmax take place and see if this information could be made available.

Three (3) 25 kV–4.16 kV 14 MVA rated power CE&S transformers are installed which feed sections of a 5 kV switchgear line-up. Each section of 5 kV switchgear is rated for 2,000 amps at 4,160 Volts 3-phase. Each section of switchgear has a tie breaker connecting it to the section adjacent to it. These tie breakers are automatic and will close as soon as the main feeder breaker opens in the event of a failure. The entire system is designed for an N+1 configuration with a total of 28 MVA available with one redundant 14 MVA transformer.

### Big Four Building

The Big Four Building is fed with a radial feed from the substation with 400 amp fusing at 5kV. This equates to 3.0 MVA with no redundancy.

The low voltage distribution is comprised of a double ended 347/600 volt 3-phase 2,000 amp switchboard that is currently fed with a radial feed from a single 1,500 kVA transformer. The tie breaker is currently in the closed position.

### Power Capacity Upgrades

#### Substation

The CE&S substation has the capacity to accommodate the additional requirements for the International Broadcasting Centre.

There will be a requirement to take a holistic view of the type and timing of the activities that will occur on Stampede Park. This report focuses on the BMO / Big Four Building and the requirements for these facilities

only. The substation can accommodate the electrical requirements for the BMO / Big Four however the substation may not be able to accommodate the IBC based on other events that may be occurring at the same time on Stampede Park.

### Stampede Park Infrastructure

The existing electrical infrastructure includes underground concrete encased duct banks that facilitate the routing for 5 kV electrical cables from the substation to the Big Four Building (and other buildings on Stampede Park). The existing underground duct bank system which runs to the Big Four Building is at capacity in certain locations.

### Stampede Park Infrastructure Upgrades

There would be additional underground ducts required to accommodate the new feeders to increase the capacity to the Big Four Building. Along with the additional underground ducts there would be a requirement for alterations to existing underground vaults or the installation of new underground vaults that would tie into the existing underground duct bank network.

### Big Four Building

The supply feeders to the Big Four Building can be upgraded to provide the required 9 MVA of power capacity though additional feeders from the substation from another section of the 5 kV line up.

### Necessary Upgrades to Accommodate Backup Requirements

The requirements for a redundant on-site generation system can be accommodated at the Big Four Building. There is sufficient space in the adjacent parking area to locate any generators that are required. To accomplish this, there will need to be temporary power cables installed to tie in the backup system to the main systems.

The most effective way to accomplish this interconnect will be to source generators which operate at 5 kV and connect to the 5 kV infrastructure. The connection from the generators located in the parking area to the Big Four would be through the underground duct bank system. All synchronizing equipment, etc. will be part of the temporary generation system.



### Existing Lighting System

The existing lighting system on the upper floor of the Big Four Building is metal halide lighting. The existing lighting on the lower floor of the Big Four is fluorescent luminaires. Both levels are designed to host trade shows and would meet the required 400 lux lighting level required for the International Broadcasting Centre.

### Lighting System Upgrades

It is recommended to upgrade the existing lighting systems in the Big Four from metal halide to LED to ensure that lighting would immediately be available should the unlikely event a momentary interruption in power occurs. Metal halide luminaires require 5-10 minutes to cool down and re-strike following a power interruption while LED luminaires are instant on (reference Super Bowl XLVII in New Orleans where game play was interrupted due to metal halide lights re-strike time following a power interruption at the stadium).

The fluorescent luminaires in the lower level of the Big Four are approximately 28 years old and are recommended to be changed to LED linear luminaires for energy efficiency and lighting quality purposes.

### Existing Communications Infrastructure

The Big Four Building currently has three (3) different fibre feeds to the facility.

- 48 strands of fibre from the SL1 room
- 24 strands from the BMO front demark location
- 24 strands from the Grandstand

### Communication Infrastructure Upgrades

The existing telecommunication infrastructure includes underground concrete encased duct banks that facilitate the routing for fibre optic cabling from the Demark location within the BMO Centre to the Big Four Building (and other buildings on Stampede Park). The existing underground duct bank system which runs to the Big Four Building is at capacity in certain locations.

#### Stampede Park Infrastructure Upgrades

There would be additional underground ducts required to accommodate new fibre optic cabling to the Big Four Building. Along with the additional underground ducts there would be a requirement for alterations to existing underground vaults or the installation of new underground vaults that would tie into the existing underground duct bank network.

# COST REVIEW

April 6, 2017

Job No. 13130.100500.009

Gibbs Gage Architects  
350, 140 - 10<sup>th</sup> Avenue SE  
Calgary, AB, T2G 0R1  
Phone: 403.233.2000

Attention: Mr. David Wittman, Architect, AAA B.Env.D, M.Arch., LEED AP, Design Manager

**Re: CBEC Study – IBC / MPC, Calgary, AB - Class 5 Cost Estimate (R1)**

Dear David,

We submit for your review our updated Class 5 Estimate (R1), in accordance with the terms of our engagement.

The estimate includes all direct and indirect construction costs, subject to certain exclusions, and general conditions, as well as, contractor's overheads and profit. The estimate also addresses the following contingencies and allowance values.

- A design and pricing contingency has been **included** in the estimate.
- Escalation allowance of construction has been **excluded** in the estimate.
- Construction (change order) allowance has been **included** in the estimate.
- An allowance for "soft costs" has been **included** in the estimate.

This report is not intended for general circulation, publication or reproduction for any other person or purpose without express written permission to each specific instance. Furthermore, this report was produced for the exclusive use of Gibbs Gage Architects and Calgary Bid Exploration Committee and is not to be relied upon by any other party. Altus Group Limited does not hold any reporting responsibility to any other party.

Should you have any questions related to this report please do not hesitate to contact the undersigned at the address listed below.

Yours truly,

**ALTUS GROUP LIMITED**



Per: Richardson Nazar, AssocRICS  
Senior Cost Consultant



Per: David Crane, MRICS, PQS  
Senior Director

# 1 Introduction

## 1.1 General Information

This updated Class 5 cost estimate is intended to provide a realistic budget for upgrading the existing BMO Centre, Big 4 and Corral facilities to accommodate the International Broadcast Centre (IBC) and Media Press Centre (MPC) for the proposed Calgary bid on the 2026 Winter Olympics. The estimate reflects our opinion as to the fair market value for the construction of this proposed project and is not intended to predict the lowest bid.

The details outlining inclusions and assumptions are described within Appendix A to C of this report. This report includes all direct and indirect construction costs with the following exclusions as noted in section 1.2 below.

## 1.2 Exclusions

The following items are excluded in this report:

- Land acquisition, survey and associated costs
- Financing cost
- Phased construction
- Soil remediation and/or removal
- Any work associated with asbestos removal and maintained of contaminated asbestos work area, if required
- Upgrade/renovation works of existing areas other than those identified in the design information
- Fit-out of existing halls, temporary structure, etc. to studio finish (this estimate includes only for upgrading the existing shell and core system of the facility to suit IBC/MPC requirements)
- Studio equipment (by broadcasting company)
- Temporary generator (part of overlay budget)
- Temporary overlay structure (except where noted in Gibbs Gage design report)
- Any upgrade to the existing high voltage substation, assumed by Utility provider. Included in the estimate are incoming feeder and switchgear.
- Reinstatement of Corral after the Olympic event
- Upgrades to the existing Security and Audio/Video system in the facility
- Relocation of existing Commissary and Substation
- Any scope, program and overlay requirements outside of Gibbs Gage identified scope
- Escalation allowance
- Goods & Services Tax (GST)

## 1.3 Estimate Accuracy

This Class 5 estimate was prepared based on ongoing studies with an expected accuracy range of -50% to +100%, as per the City of Calgary Corporate Project Management Framework Estimation and Contingency Standard V1.2 document.



## **2 Project Details**

### **2.1 General Information**

From the information provided in appendix D, we have measured quantities where possible and applied unit rates considered competitive for a project of this nature, based on historical and current cost data for this type of project. Where design information was limited, we have had discussions with the relevant design disciplines and/or made assumptions based on our experience with projects of a similar type, size, and standard of quality.

### **2.2 Location**

The location cost base for this estimate is the Calgary, Alberta.

### **2.3 Measurement and Pricing**

The estimate has been prepared using generally accepted principles as to format, method of measurement and pricing. Quantities and project statistics have been calculated in general accordance with the Canadian Institute of Quantity Surveyors' Method of Measurement.

The unit rates within our report are considered competitive and are based on our experience with similar projects, and/or quotes provided by subcontractors as noted. Pricing shown reflects probable construction costs obtainable in Calgary, Alberta, on Q1, 2017. Where applicable, unit rates include labour, material, equipment, and subcontractor's overheads and profit. In instances where design information was limited, we have made reasonable assumptions based on our experience on projects of a similar nature and discussions with the design team when possible.

### **2.4 Taxes**

The estimate excludes the Goods and Services Tax (GST).

### **2.5 General Requirements and Fees**

The General Requirements and Fee included within the estimate for the Construction Manager are calculated as a percentage of the hard costs. The General Requirements are based on our assumptions of the anticipated construction approach and construction schedule for the project. The general requirements percentage includes the cost associated with bonding and insurance. Development and building permit fees are included within the soft cost allowance.

## 2 Project Details (continued)

### 2.6 Procurement Methodology

We have assumed that the project will be procured with a Construction Management approach under a CCDC 5 standard form of contract. We have assumed a minimum of five Construction Manager bids and at least three major subtrade/supplier bids received for all trade categories to establish competitive bidding and tender results. The estimate is a determination of fair market pricing and not a prediction of lowest bid in any trade category. Please note that should the above minimum bidding conditions not occur on this project, construction bids received could vary significantly from the estimated costs included within this report.

### 2.7 Schedule / Phasing

This report is based on the project being completed and/or bid as one complete project. The rates used in this report are based on current dollars and any allowance for escalation beyond the date of this report will be included as an escalation contingency. The unit rates in our estimate are based on construction activities occurring during standard business working hours and proceeding within a non-accelerated schedule.

## **3 Contingencies**

### **3.1 General**

The effective use of contingencies in construction cost planning requires a clear understanding of estimating risks in both a project specific and general construction market sense. The appropriate level of contingency is dependent on the amount of information available, knowledge of the design teams' methods and philosophy, the timing of the estimate preparation relative to the project design and construction schedule, and the anticipated complexity of the construction work.

### **3.2 Design and Pricing**

A 10% design and pricing contingency has been included in the hard cost estimate. This contingency covers the design & pricing evolution during the remain design stages of the project, please note this contingency is not intended to cover additional scope or additional functional program requirements.

### **3.3 Escalation**

Escalation allowance has been excluded from this estimate. We recommend that the client carry a separate allowance for this item in their overall project budget.

### **3.4 Construction Contingency (Post Contract)**

A 5% construction contingency has been included in the hard cost estimate. The intention of this contingency is to cover post contract change orders.

### **3.5 Soft Cost Allowance**

A 23% soft cost allowance has been included in this estimate as a percentage of the hard construction cost. This include design fee (12%), cost consultancy/independent certifier (0.4%), city administration/PM fees (3%), legal fees (0.5%), permits (1.1%), third party material testing (1%), moveable FF&E (2%) and program contingency (3%).



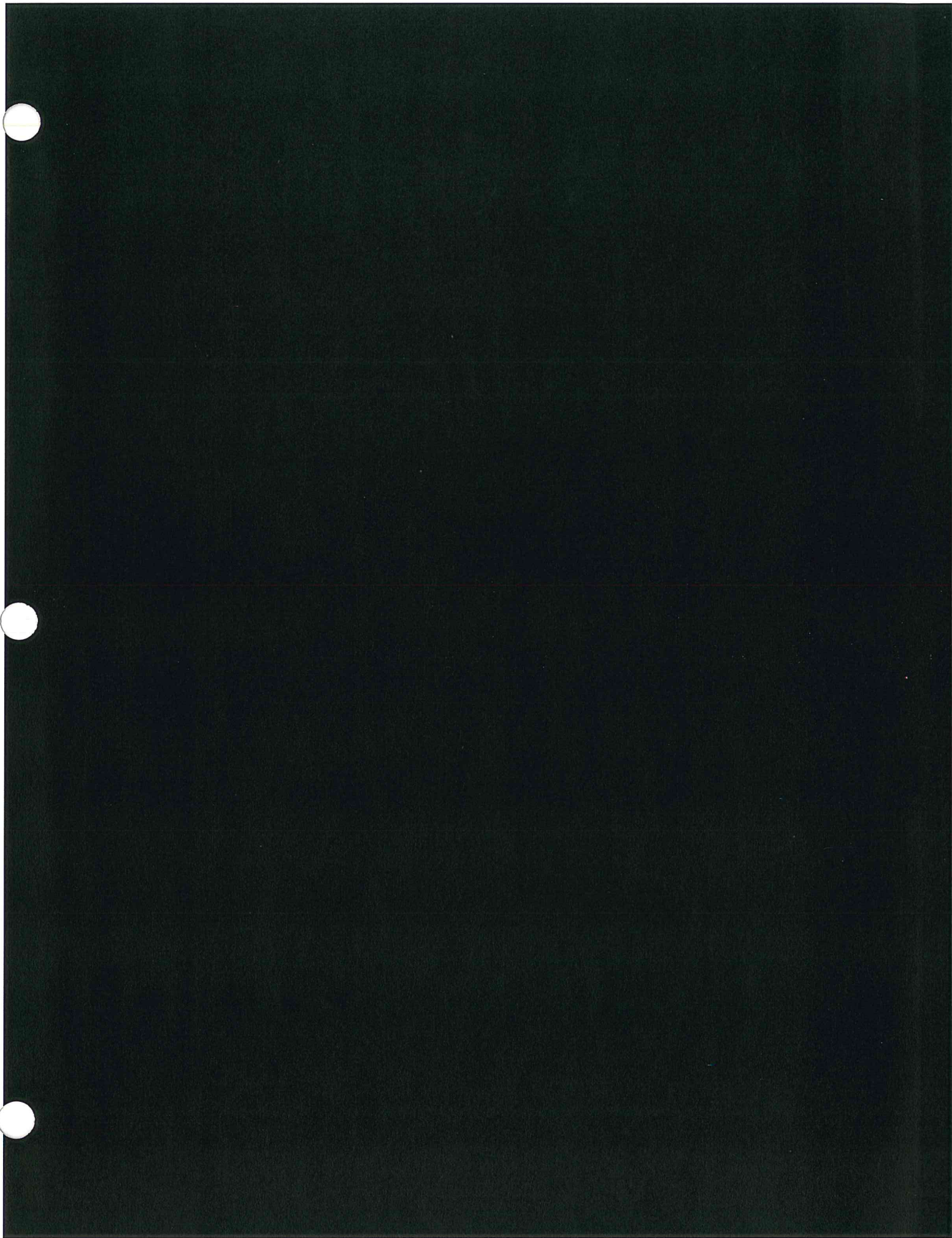
## 4 General Statement of Liability

### 4.1 Probable Costs and Ongoing Cost Control

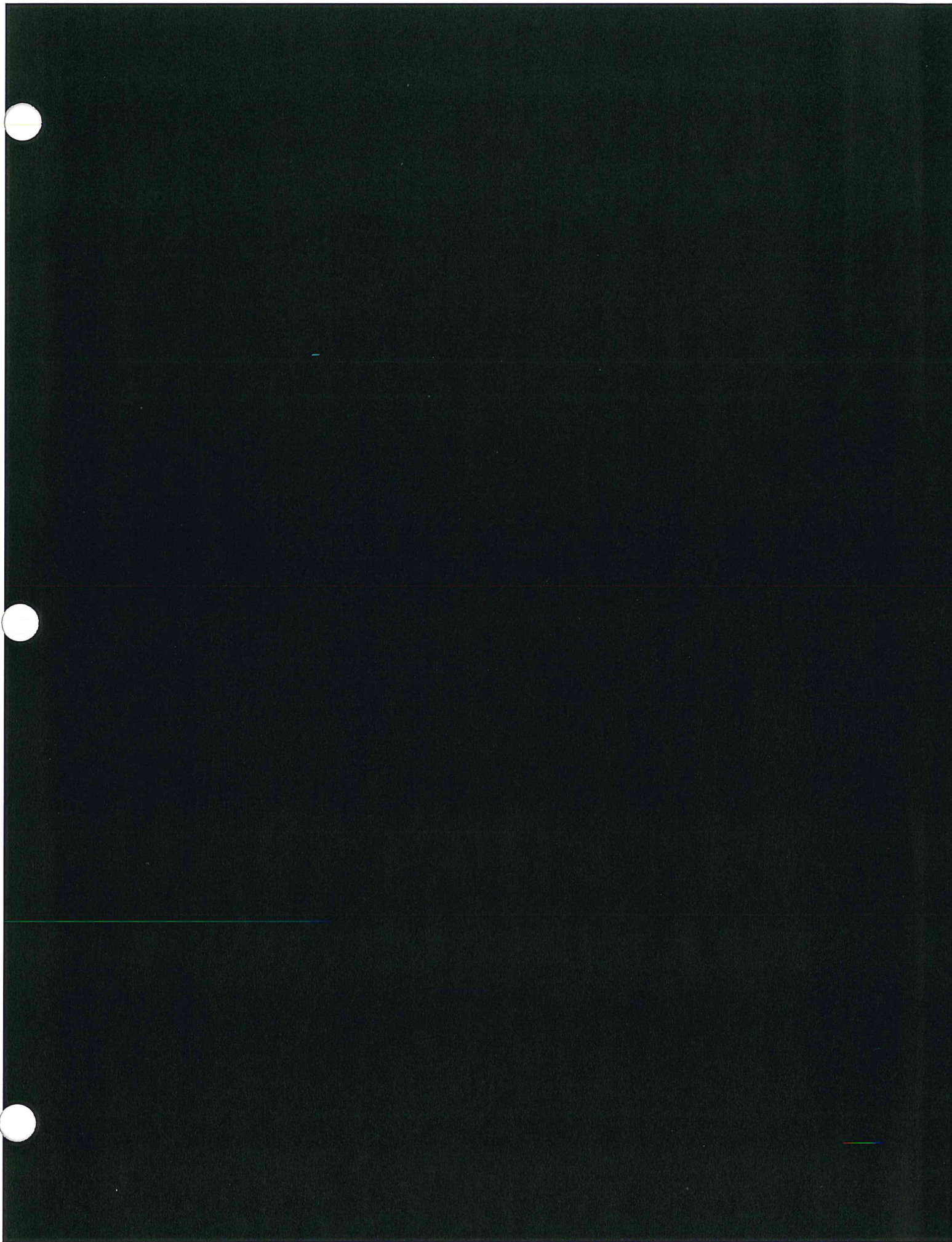
Altus Group Limited does not guarantee that tenders or actual construction costs will not vary from this estimate. Acute market conditions, proprietary specifications, or competition/collaboration among contractors may cause tenders to vary from reasonable estimates based on normal and abnormal competitive conditions.

Altus Group Limited recommends the owner and/or design team review the cost estimate report including line item descriptions, unit prices, allowances, assumptions, exclusions, and contingencies to ensure the appropriate design intent has been accurately captured within the report.

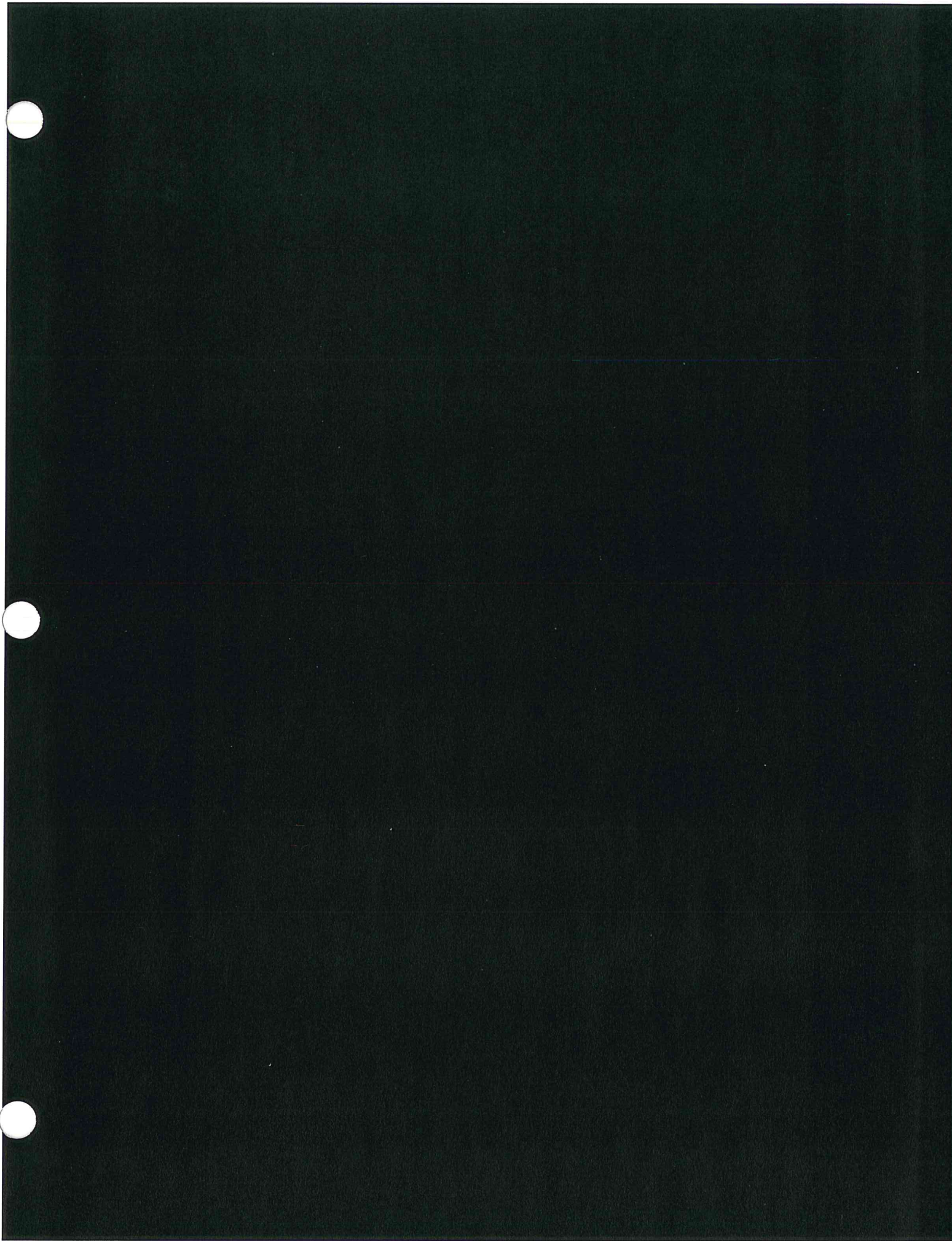
It should be noted that the cost consultants are not qualified to confirm that construction work and design is in accordance with approved plans and specifications.



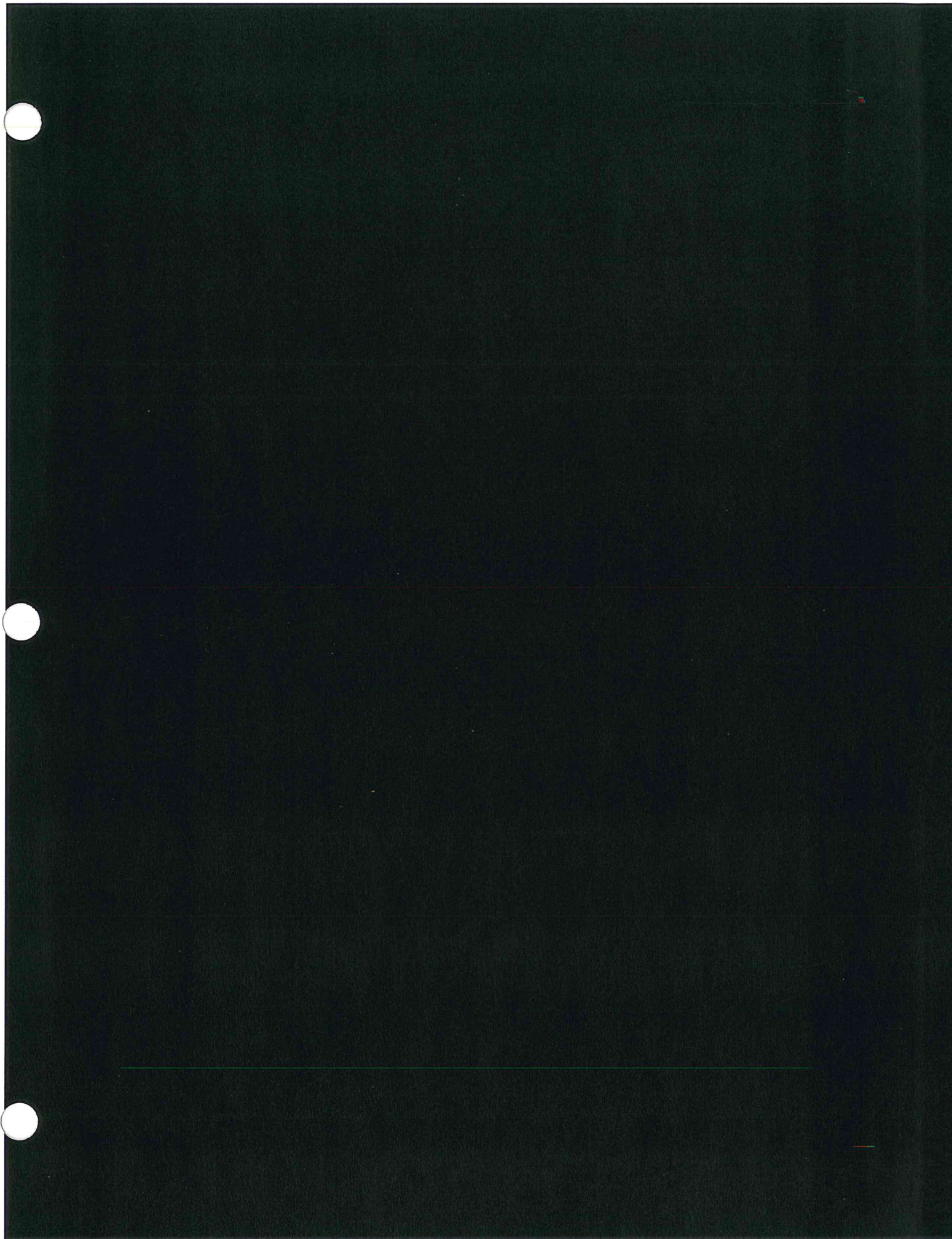




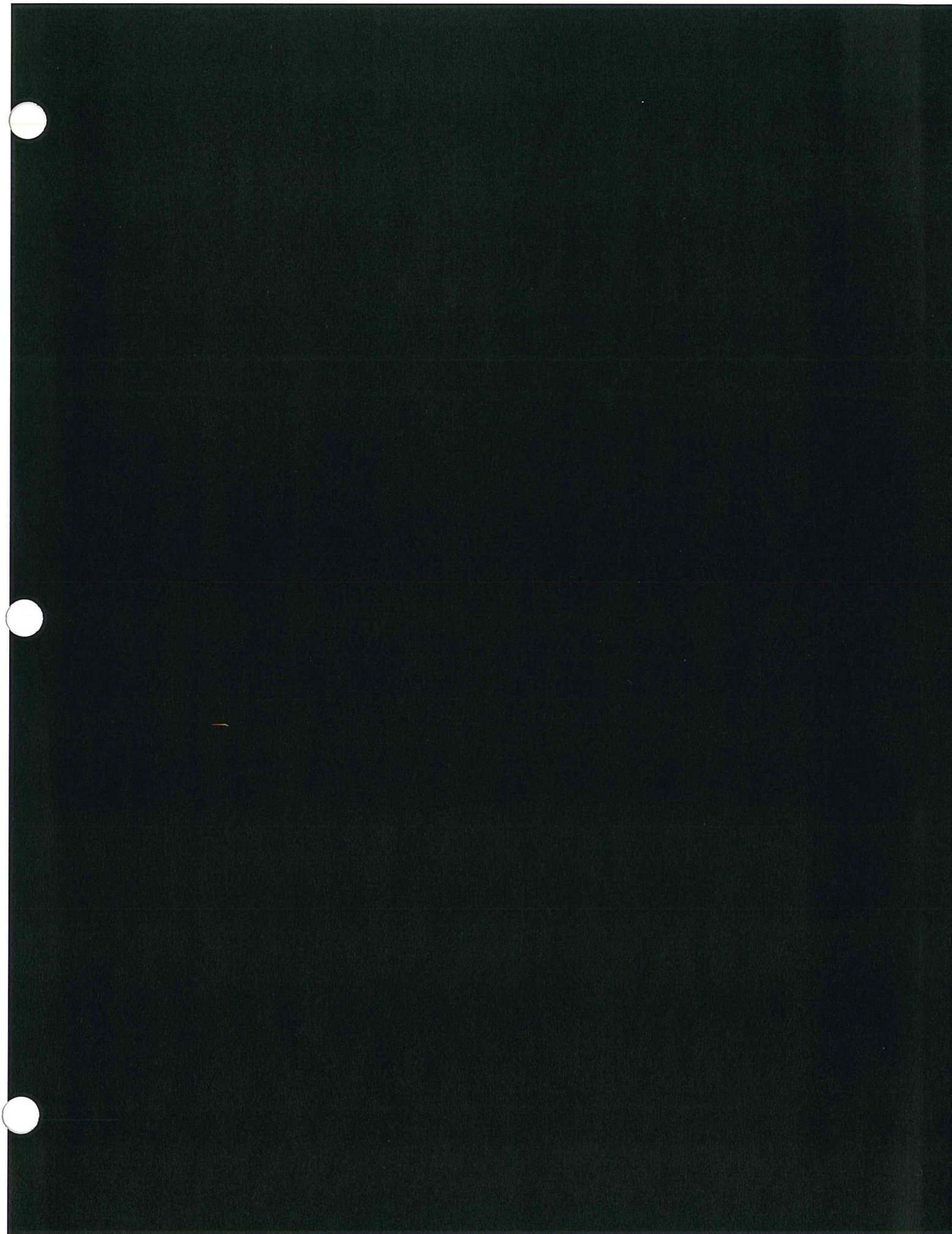




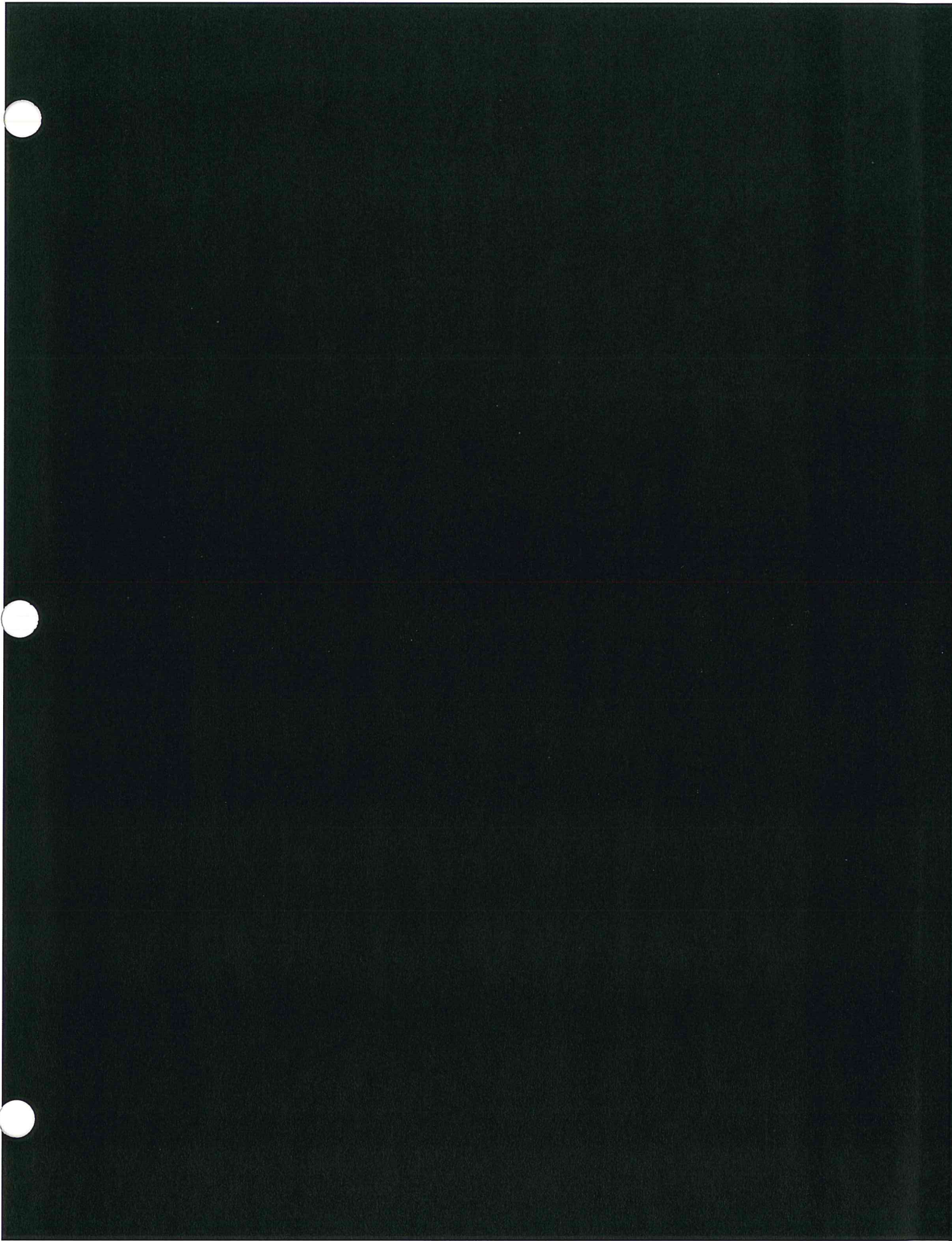




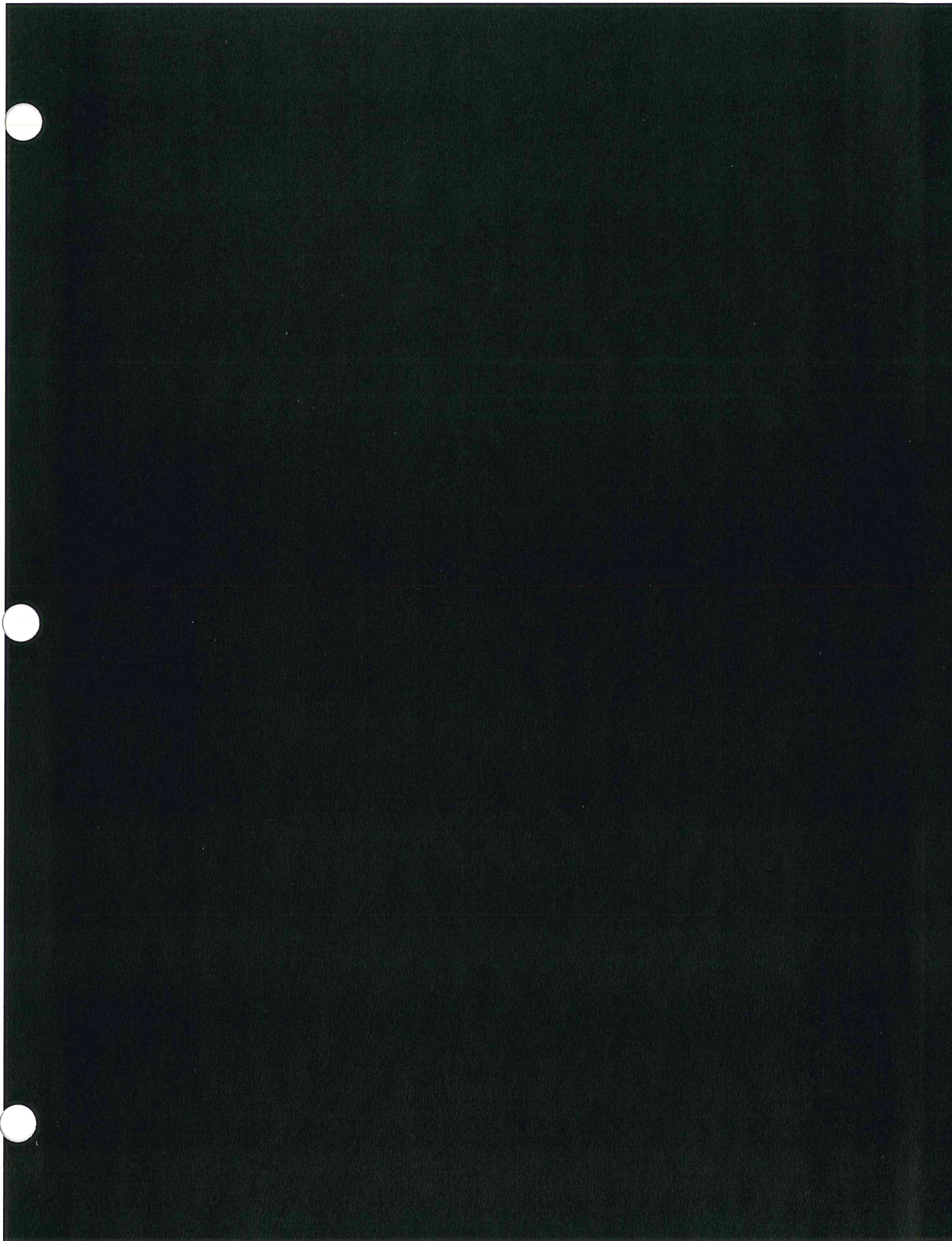




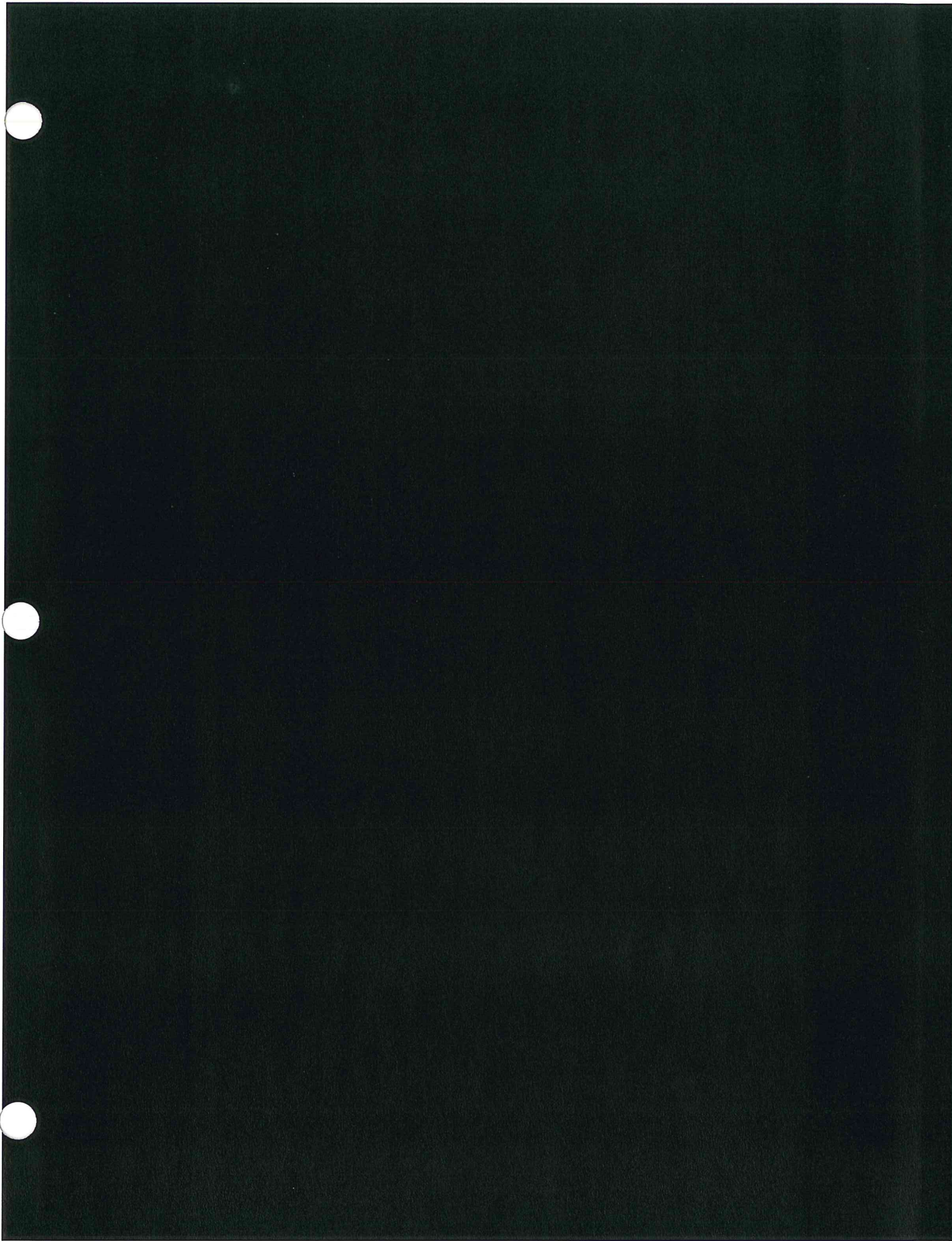




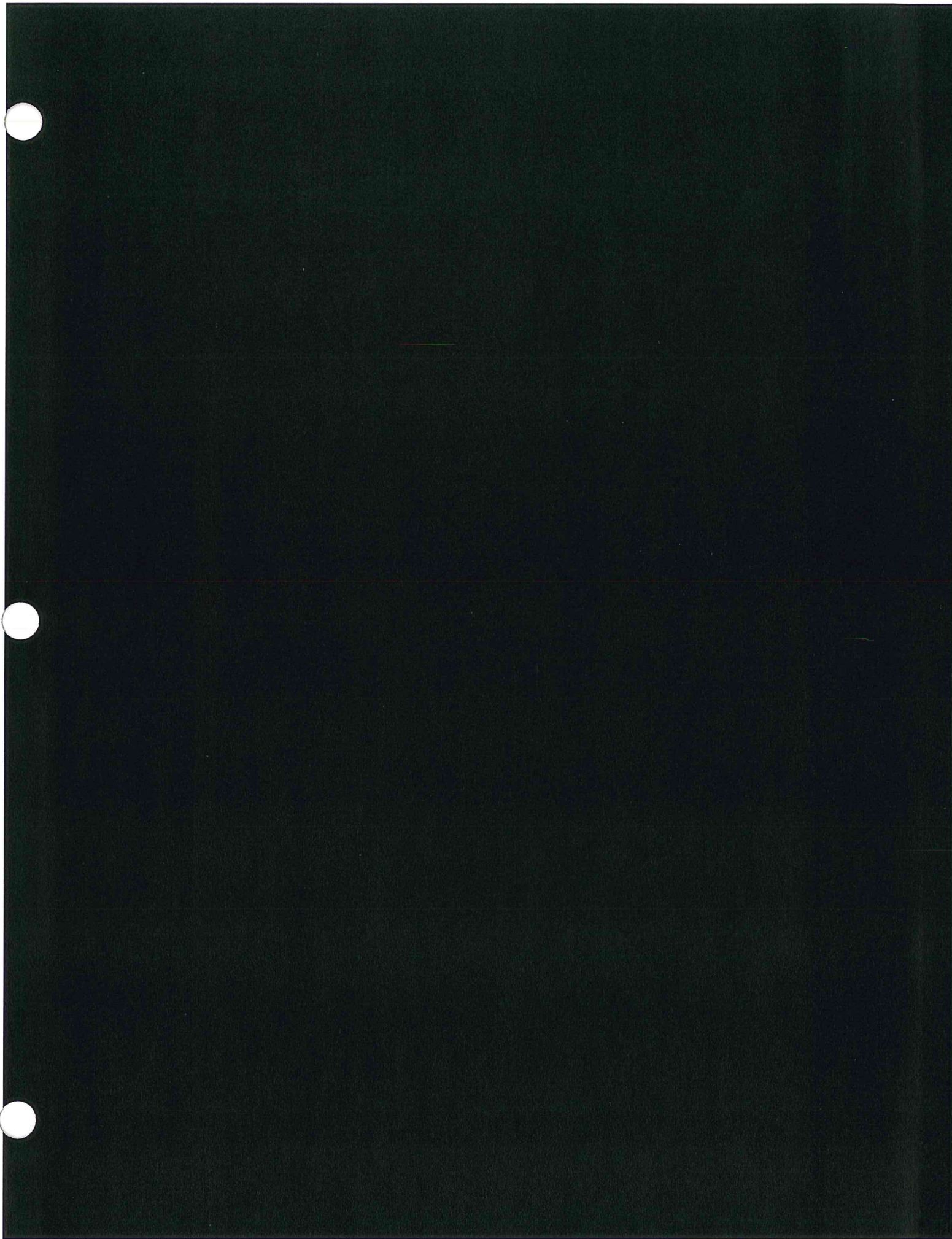




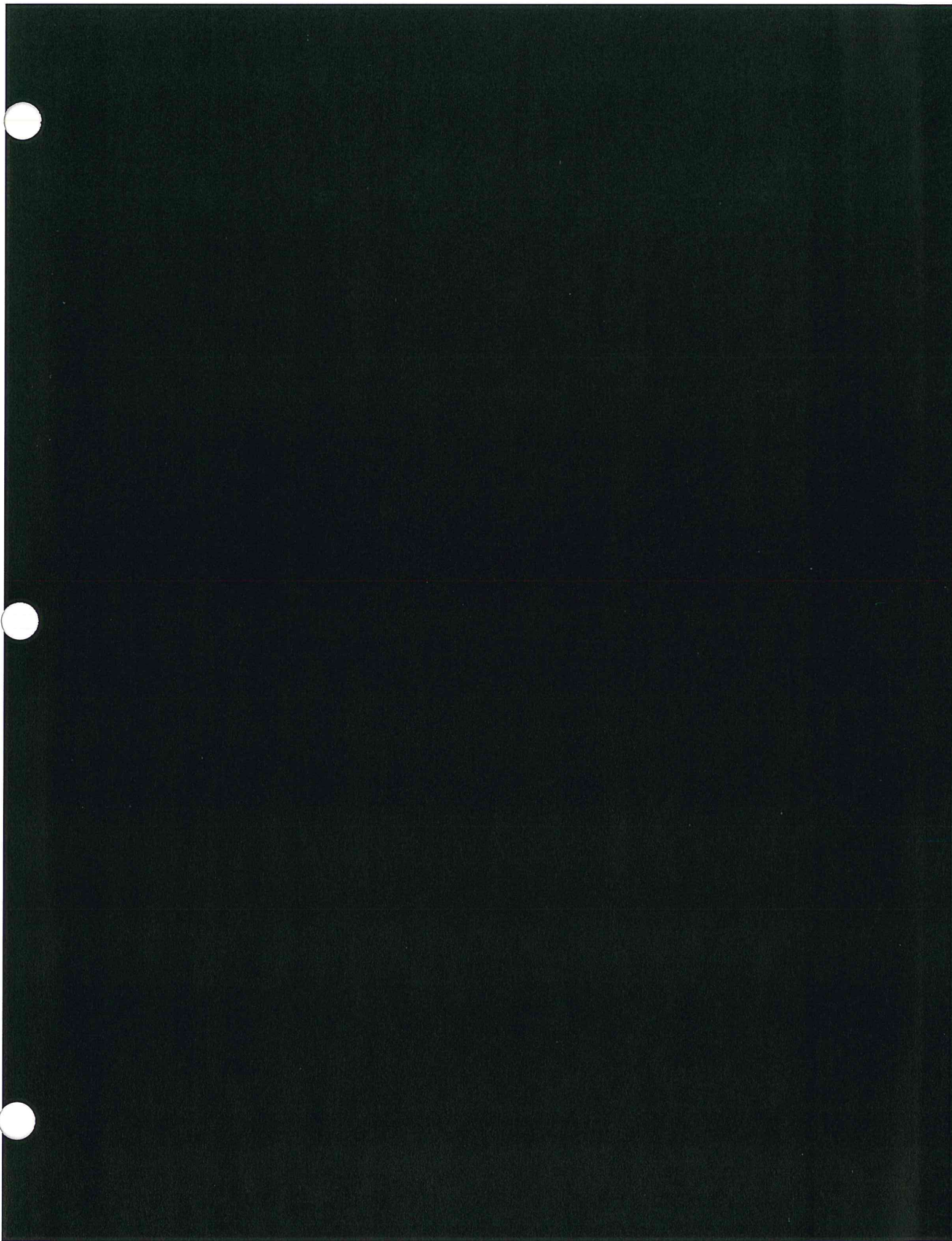




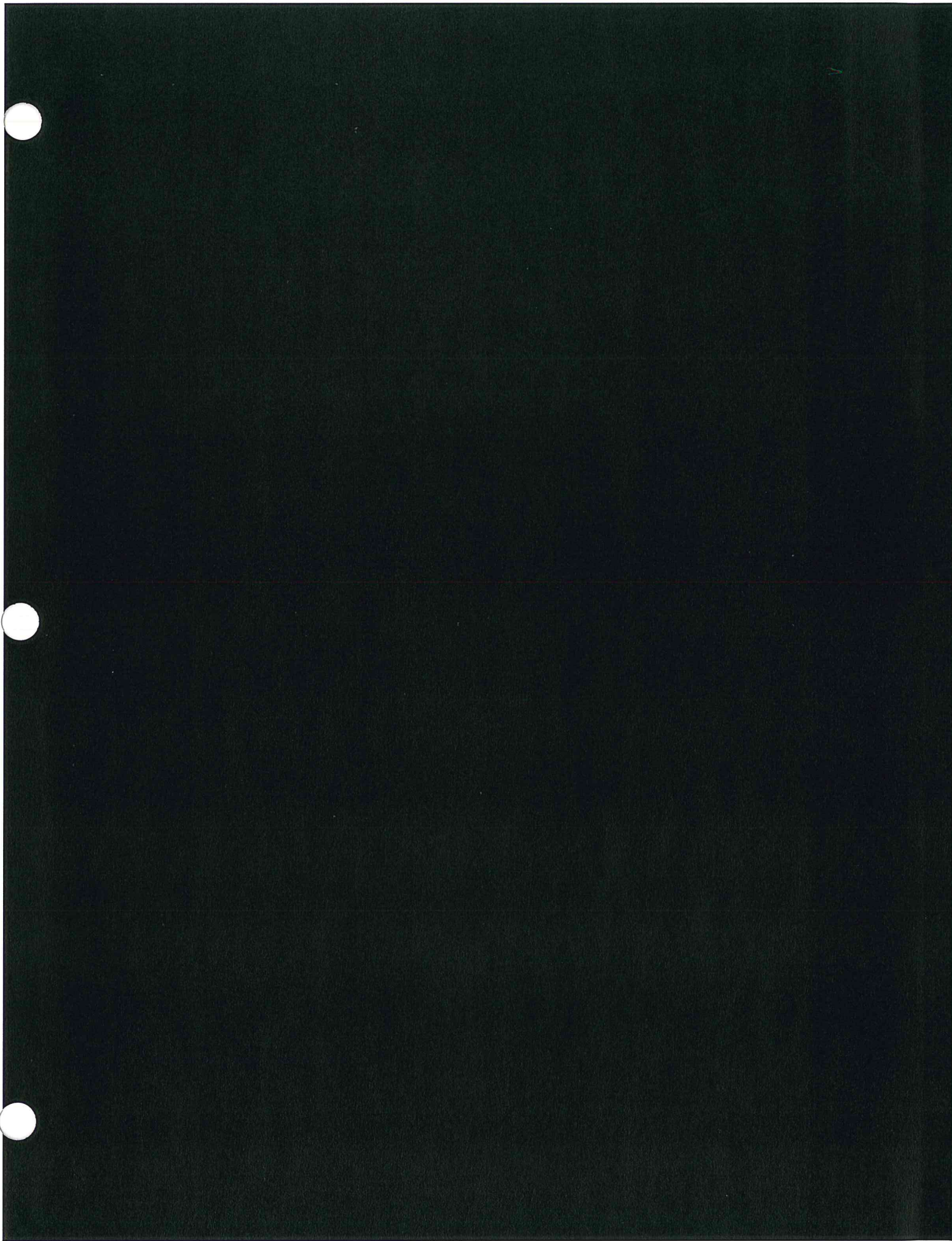




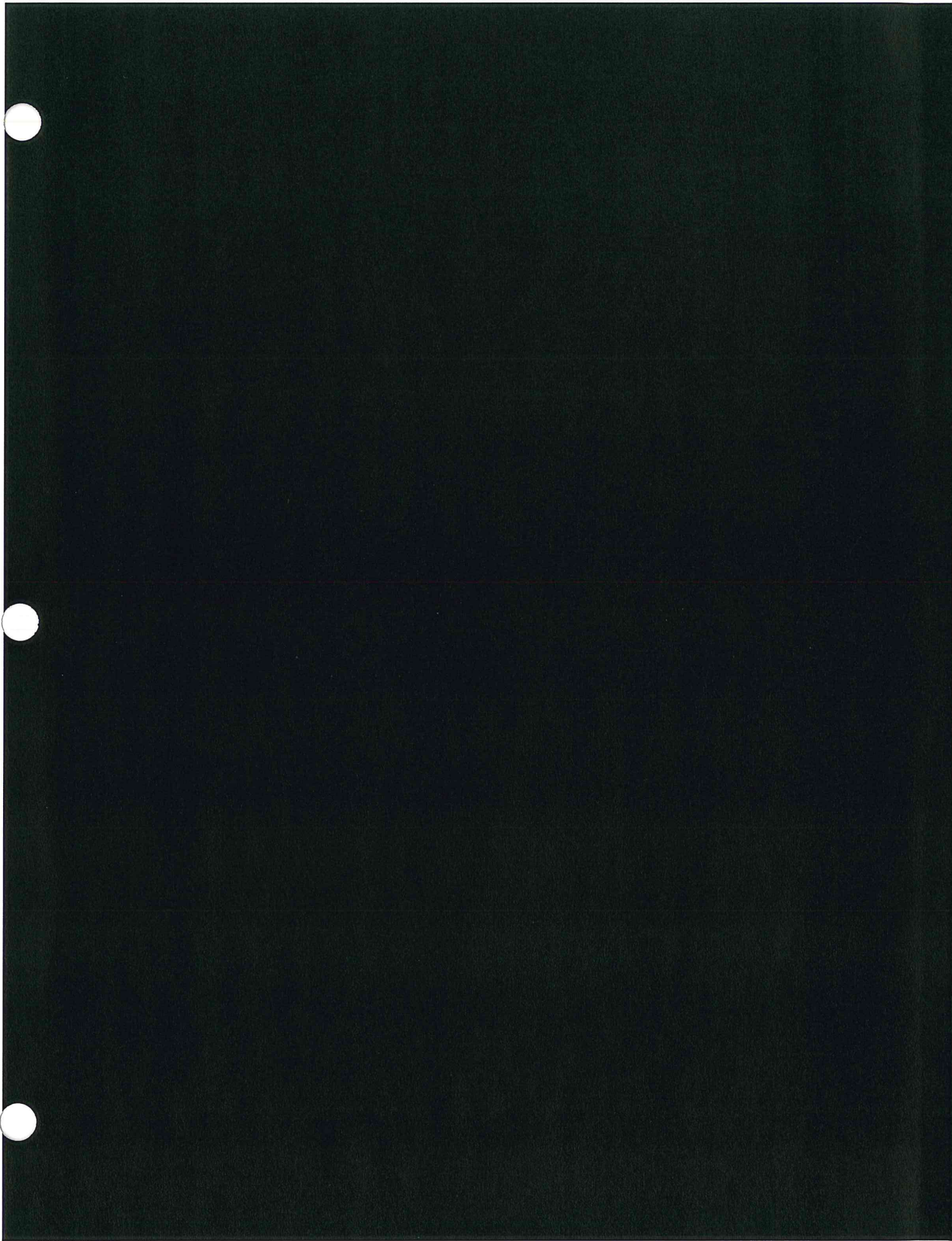




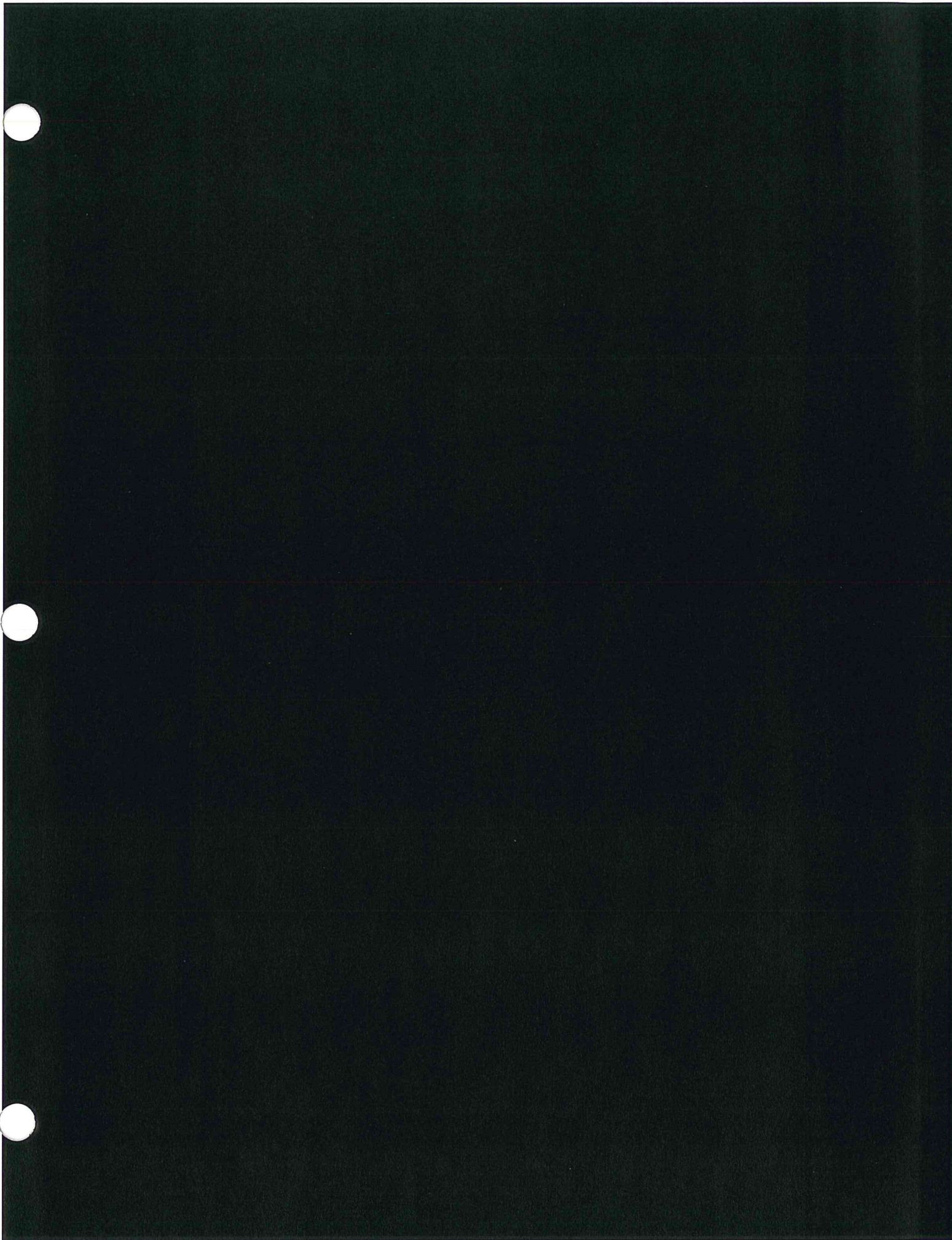




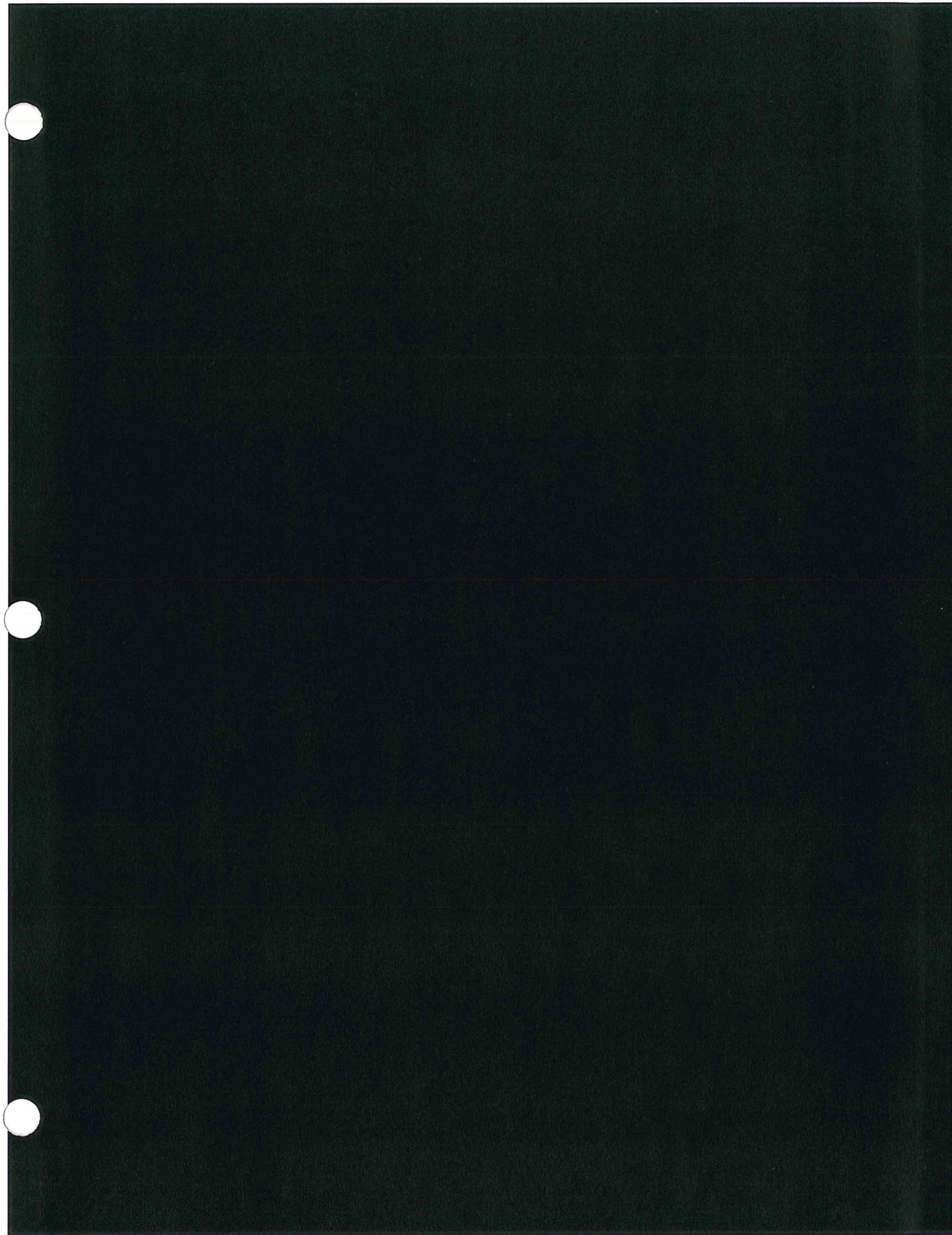




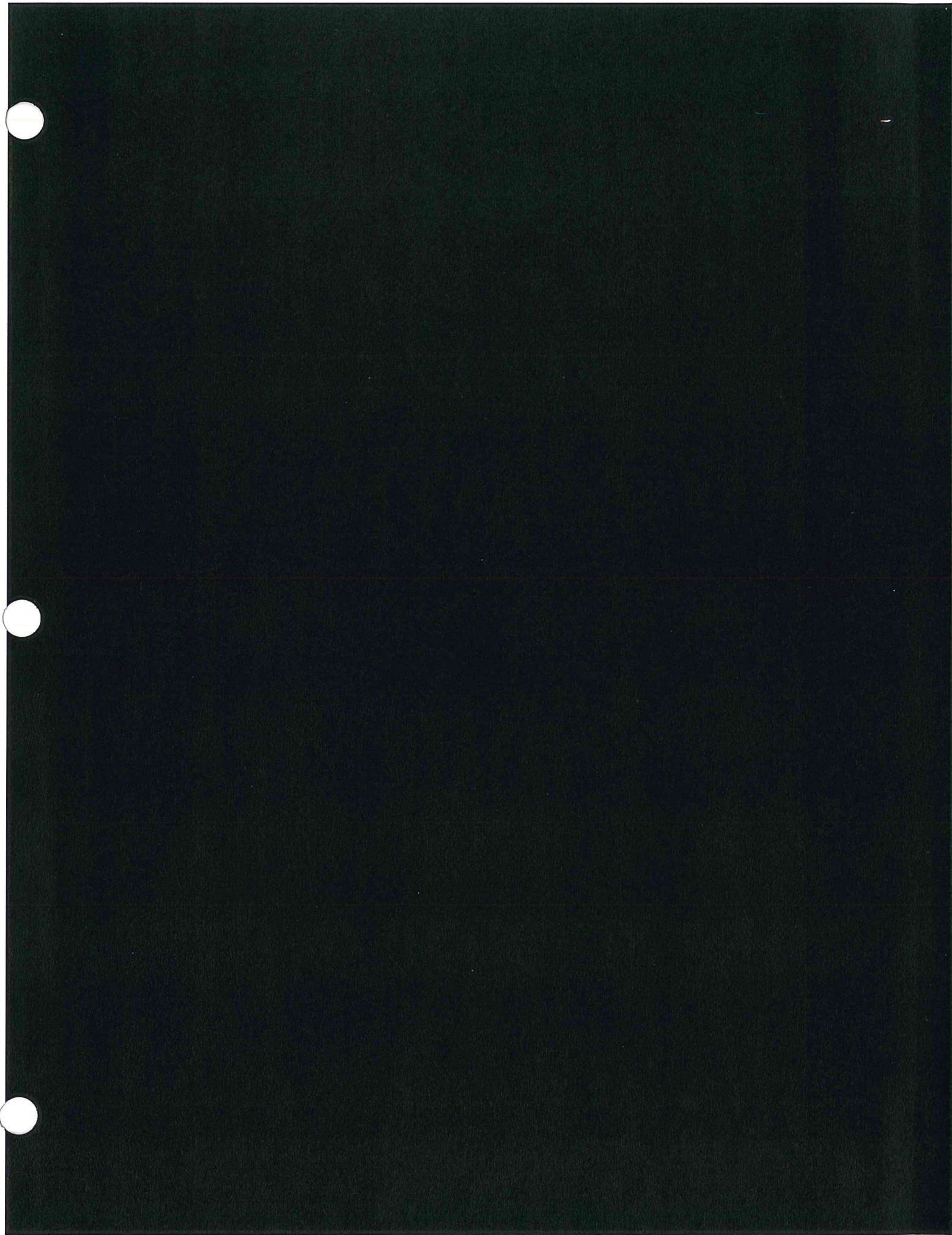




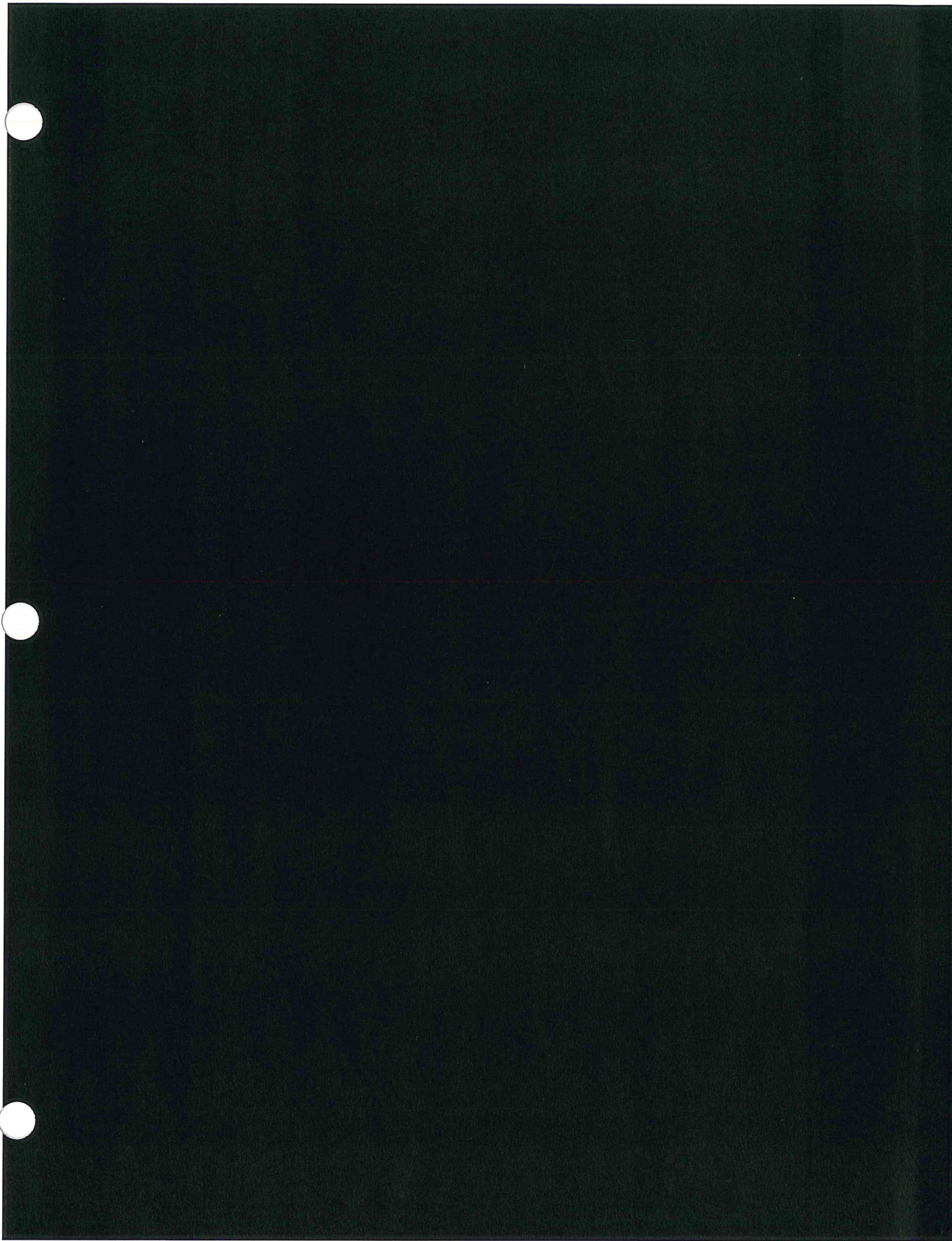














# **CBEC Study – International Broadcast Centre & Media Press Centre (IBC / MPC)**

**Calgary, Alberta**

**Class 5 Cost Estimate (R1)**

Prepared for:  
**GIBBS GAGE ARCHITECTS**  
350, 140 - 10<sup>th</sup> Avenue SE  
Calgary, AB, T2G 0R1  
Phone: 403.233.2000

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Issue: March 21, 2017  
Issue (R1): April 6, 2017  
Job No.: 13130.100500.009

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April 6, 2017

Job No. 13130.100500.009

Gibbs Gage Architects  
350, 140 - 10<sup>th</sup> Avenue SE  
Calgary, AB, T2G 0R1  
Phone: 403.233.2000

Attention: Mr. David Wittman, Architect, AAA B.Env.D, M.Arch., LEED AP, Design Manager

**Re: CBEC Study – IBC / MPC, Calgary, AB - Class 5 Cost Estimate (R1)**

Dear David,

We submit for your review our updated Class 5 Estimate (R1), in accordance with the terms of our engagement.

The estimate includes all direct and indirect construction costs, subject to certain exclusions, and general conditions, as well as, contractor's overheads and profit. The estimate also addresses the following contingencies and allowance values.

- A design and pricing contingency has been **included** in the estimate.
- Escalation allowance of construction has been **excluded** in the estimate.
- Construction (change order) allowance has been **included** in the estimate.
- An allowance for "soft costs" has been **included** in the estimate.

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Should you have any questions related to this report please do not hesitate to contact the undersigned at the address listed below.

Yours truly,

**ALTUS GROUP LIMITED**



Per: Richardson Nazar, AssocRICS  
Senior Cost Consultant



Per: David Crane, MRICS, PQS  
Senior Director

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# 1 Introduction

## 1.1 General Information

This updated Class 5 cost estimate is intended to provide a realistic budget for upgrading the existing BMO Centre, Big 4 and Corral facilities to accommodate the International Broadcast Centre (IBC) and Media Press Centre (MPC) for the proposed Calgary bid on the 2026 Winter Olympics. The estimate reflects our opinion as to the fair market value for the construction of this proposed project and is not intended to predict the lowest bid.

The details outlining inclusions and assumptions are described within Appendix A to C of this report. This report includes all direct and indirect construction costs with the following exclusions as noted in section 1.2 below.

## 1.2 Exclusions

The following items are excluded in this report:

- Land acquisition, survey and associated costs
- Financing cost
- Phased construction
- Soil remediation and/or removal
- Any work associated with asbestos removal and maintained of contaminated asbestos work area, if required
- Upgrade/renovation works of existing areas other than those identified in the design information
- Fit-out of existing halls, temporary structure, etc. to studio finish (this estimate includes only for upgrading the existing shell and core system of the facility to suit IBC/MPC requirements)
- Studio equipment (by broadcasting company)
- Temporary generator (part of overlay budget)
- Temporary overlay structure (except where noted in Gibbs Gage design report)
- Any upgrade to the existing high voltage substation, assumed by Utility provider. Included in the estimate are incoming feeder and switchgear.
- Reinstatement of Corral after the Olympic event
- Upgrades to the existing Security and Audio/Video system in the facility
- Relocation of existing Commissary and Substation
- Any scope, program and overlay requirements outside of Gibbs Gage identified scope
- Escalation allowance
- Goods & Services Tax (GST)

## 1.3 Estimate Accuracy

This Class 5 estimate was prepared based on ongoing studies with an expected accuracy range of -50% to +100%, as per the City of Calgary Corporate Project Management Framework Estimation and Contingency Standard V1.2 document.

## **2 Project Details**

### **2.1 General Information**

From the information provided in appendix D, we have measured quantities where possible and applied unit rates considered competitive for a project of this nature, based on historical and current cost data for this type of project. Where design information was limited, we have had discussions with the relevant design disciplines and/or made assumptions based on our experience with projects of a similar type, size, and standard of quality.

### **2.2 Location**

The location cost base for this estimate is the Calgary, Alberta.

### **2.3 Measurement and Pricing**

The estimate has been prepared using generally accepted principles as to format, method of measurement and pricing. Quantities and project statistics have been calculated in general accordance with the Canadian Institute of Quantity Surveyors' Method of Measurement.

The unit rates within our report are considered competitive and are based on our experience with similar projects, and/or quotes provided by subcontractors as noted. Pricing shown reflects probable construction costs obtainable in Calgary, Alberta, on Q1, 2017. Where applicable, unit rates include labour, material, equipment, and subcontractor's overheads and profit. In instances where design information was limited, we have made reasonable assumptions based on our experience on projects of a similar nature and discussions with the design team when possible.

### **2.4 Taxes**

The estimate excludes the Goods and Services Tax (GST).

### **2.5 General Requirements and Fees**

The General Requirements and Fee included within the estimate for the Construction Manager are calculated as a percentage of the hard costs. The General Requirements are based on our assumptions of the anticipated construction approach and construction schedule for the project. The general requirements percentage includes the cost associated with bonding and insurance. Development and building permit fees are included within the soft cost allowance.



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## 2 Project Details (continued)

### 2.6 Procurement Methodology

We have assumed that the project will be procured with a Construction Management approach under a CCDC 5 standard form of contract. We have assumed a minimum of five Construction Manager bids and at least three major subtrade/supplier bids received for all trade categories to establish competitive bidding and tender results. The estimate is a determination of fair market pricing and not a prediction of lowest bid in any trade category. Please note that should the above minimum bidding conditions not occur on this project, construction bids received could vary significantly from the estimated costs included within this report.

### 2.7 Schedule / Phasing

This report is based on the project being completed and/or bid as one complete project. The rates used in this report are based on current dollars and any allowance for escalation beyond the date of this report will be included as an escalation contingency. The unit rates in our estimate are based on construction activities occurring during standard business working hours and proceeding within a non-accelerated schedule.

## 3 Contingencies

### 3.1 General

The effective use of contingencies in construction cost planning requires a clear understanding of estimating risks in both a project specific and general construction market sense. The appropriate level of contingency is dependent on the amount of information available, knowledge of the design teams' methods and philosophy, the timing of the estimate preparation relative to the project design and construction schedule, and the anticipated complexity of the construction work.

### 3.2 Design and Pricing

A 10% design and pricing contingency has been included in the hard cost estimate. This contingency covers the design & pricing evolution during the remain design stages of the project, please note this contingency is not intended to cover additional scope or additional functional program requirements.

### 3.3 Escalation

Escalation allowance has been excluded from this estimate. We recommend that the client carry a separate allowance for this item in their overall project budget.

### 3.4 Construction Contingency (Post Contract)

A 5% construction contingency has been included in the hard cost estimate. The intention of this contingency is to cover post contract change orders.

### 3.5 Soft Cost Allowance

A 23% soft cost allowance has been included in this estimate as a percentage of the hard construction cost. This include design fee (12%), cost consultancy/independent certifier (0.4%), city administration/PM fees (3%), legal fees (0.5%), permits (1.1%), third party material testing (1%), moveable FF&E (2%) and program contingency (3%).



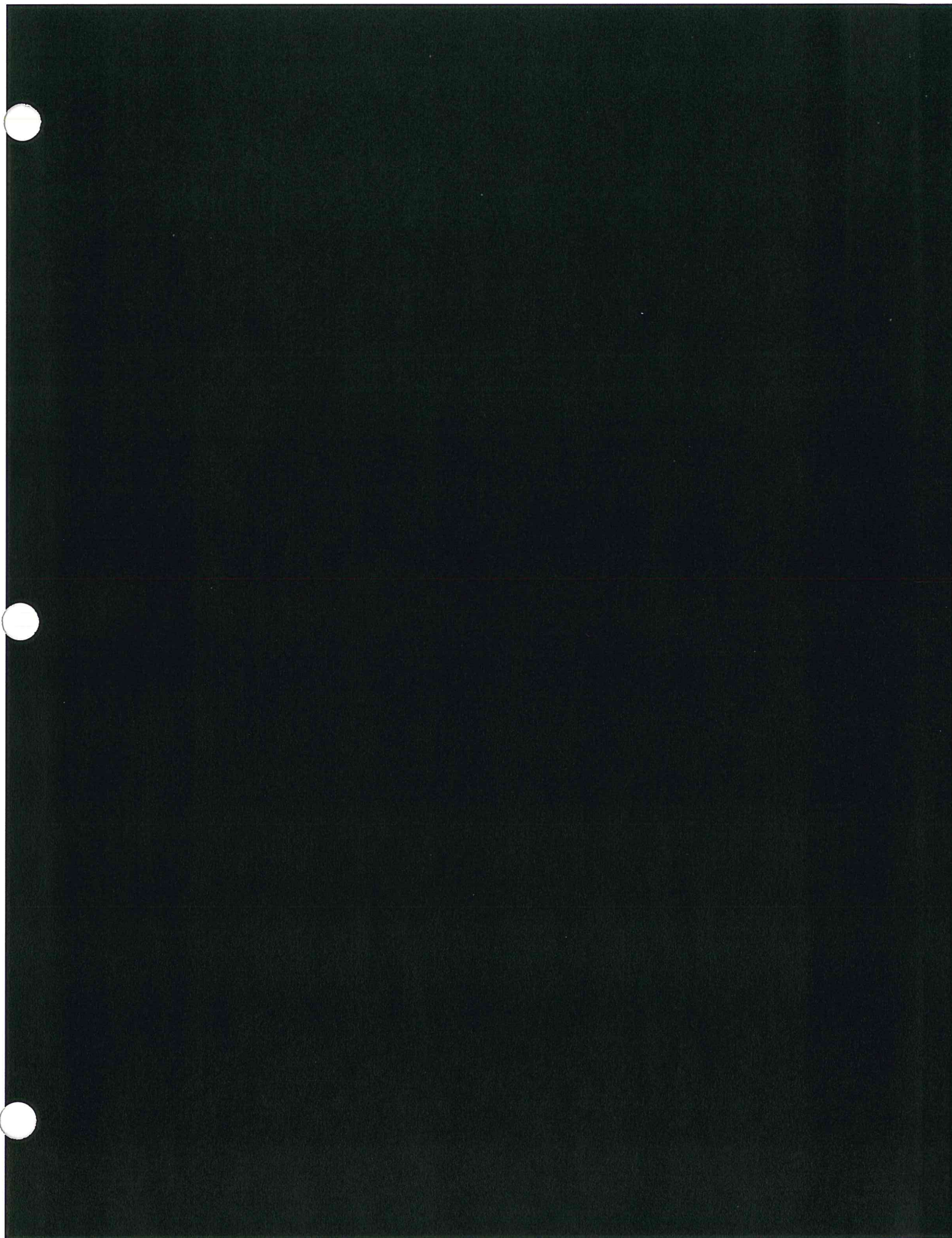
## 4 General Statement of Liability

### 4.1 Probable Costs and Ongoing Cost Control

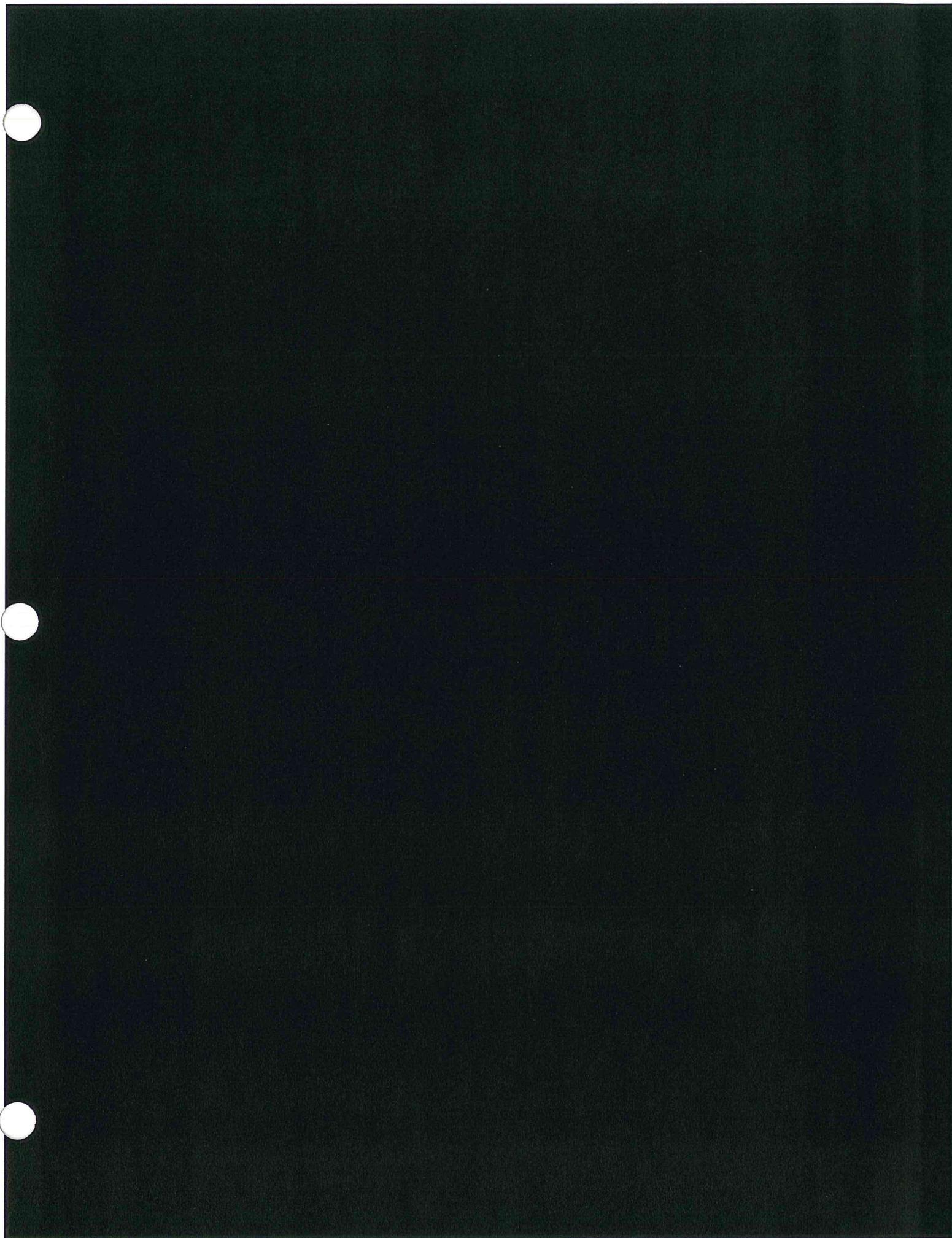
Altus Group Limited does not guarantee that tenders or actual construction costs will not vary from this estimate. Acute market conditions, proprietary specifications, or competition/collaboration among contractors may cause tenders to vary from reasonable estimates based on normal and abnormal competitive conditions.

Altus Group Limited recommends the owner and/or design team review the cost estimate report including line item descriptions, unit prices, allowances, assumptions, exclusions, and contingencies to ensure the appropriate design intent has been accurately captured within the report.

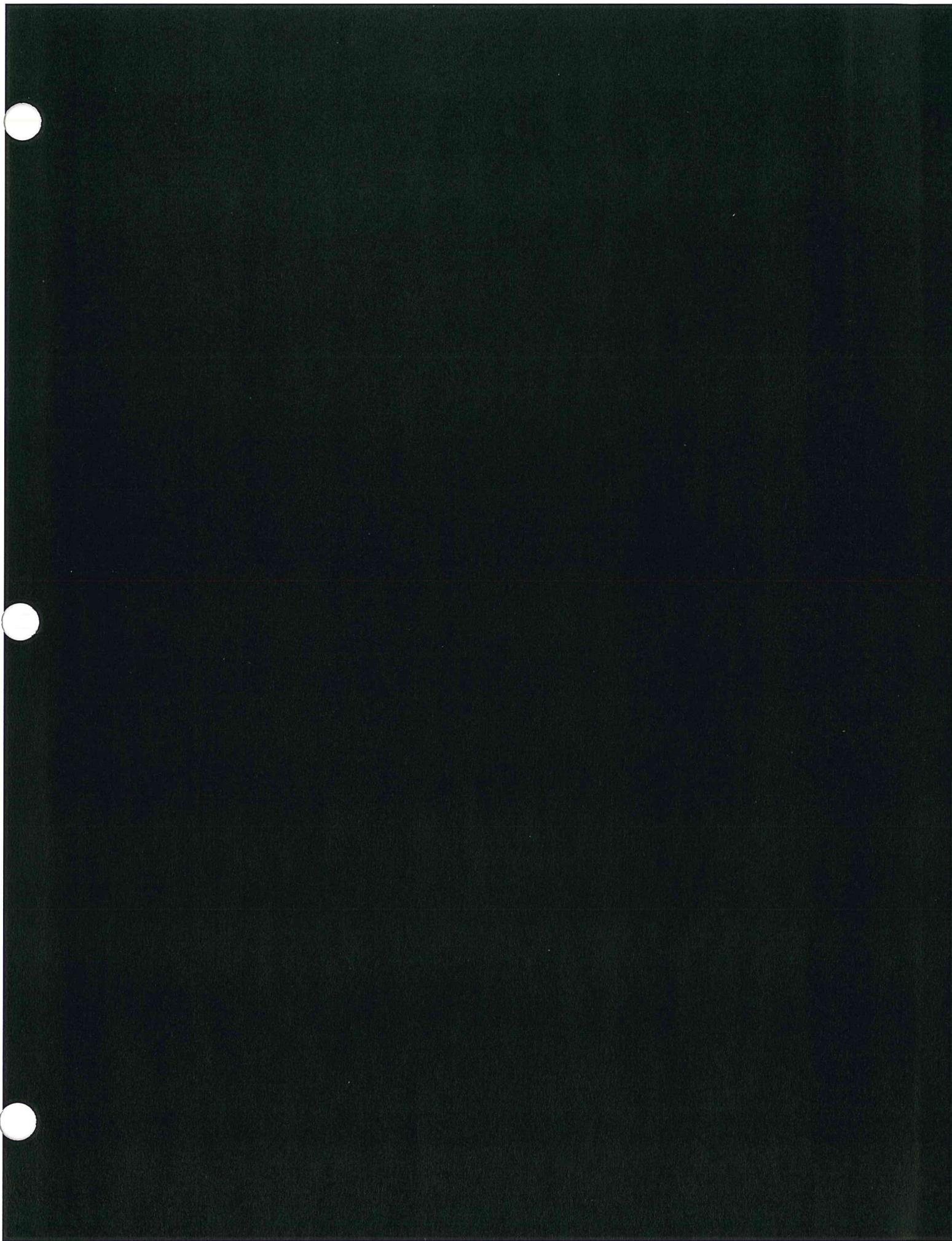
It should be noted that the cost consultants are not qualified to confirm that construction work and design is in accordance with approved plans and specifications.



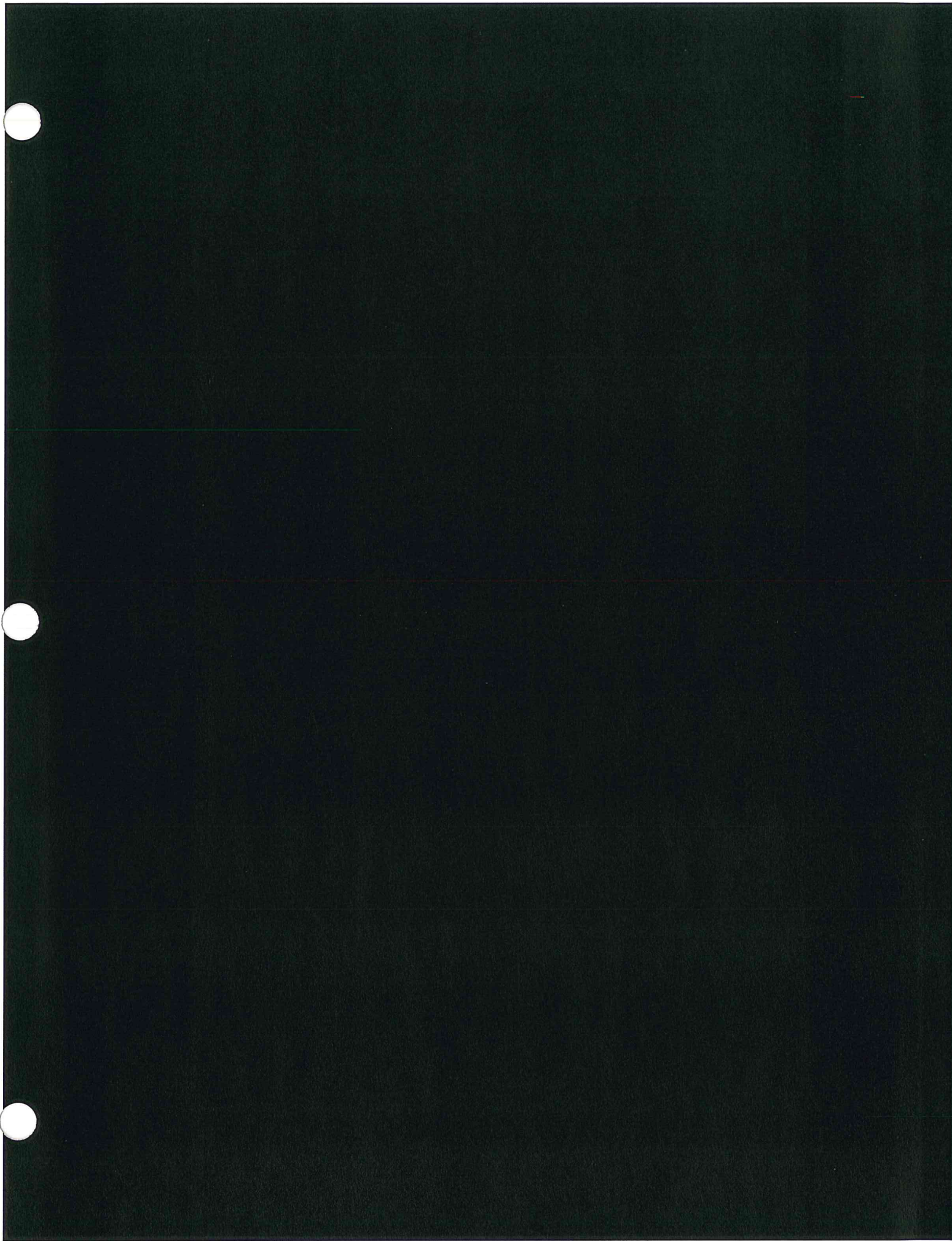




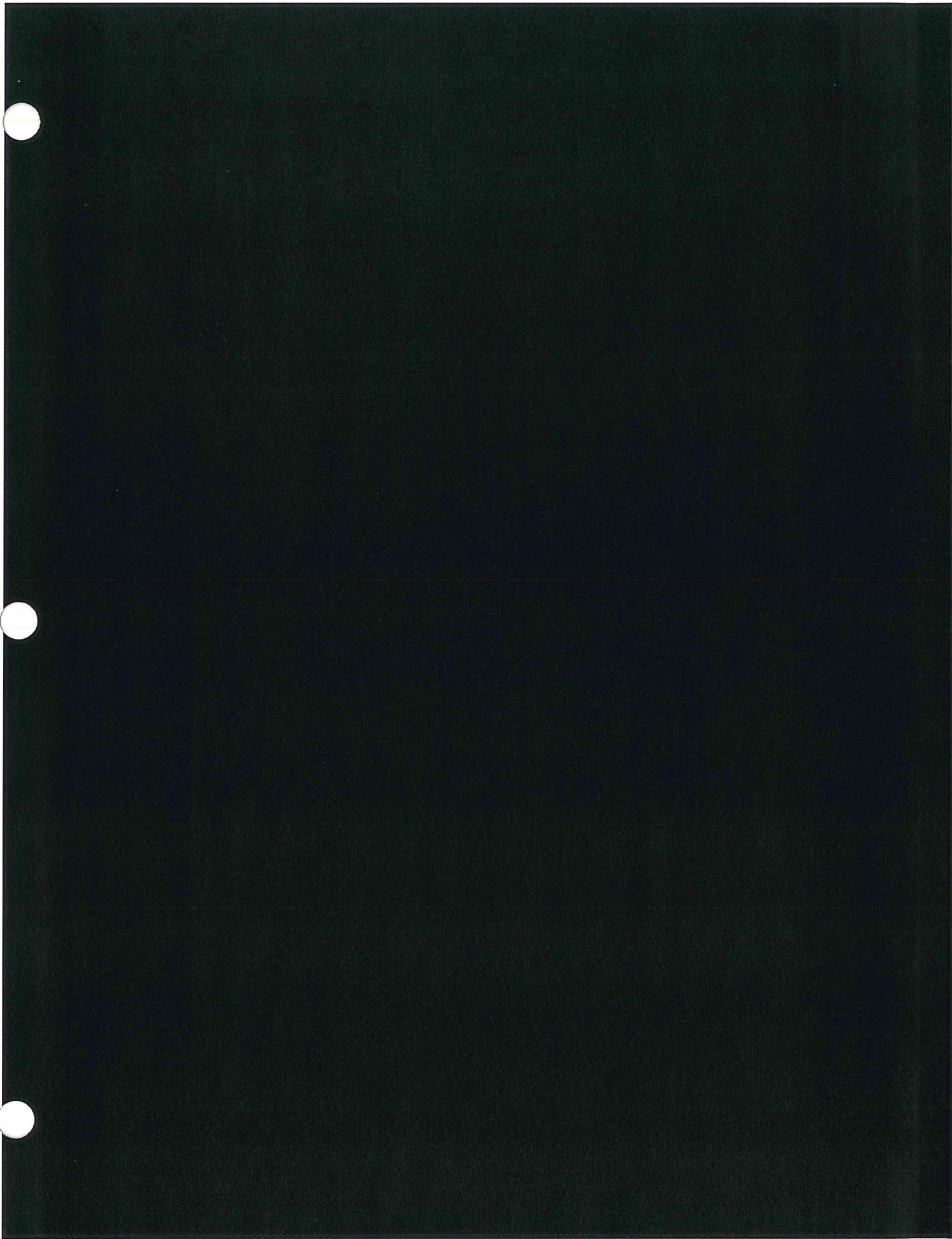




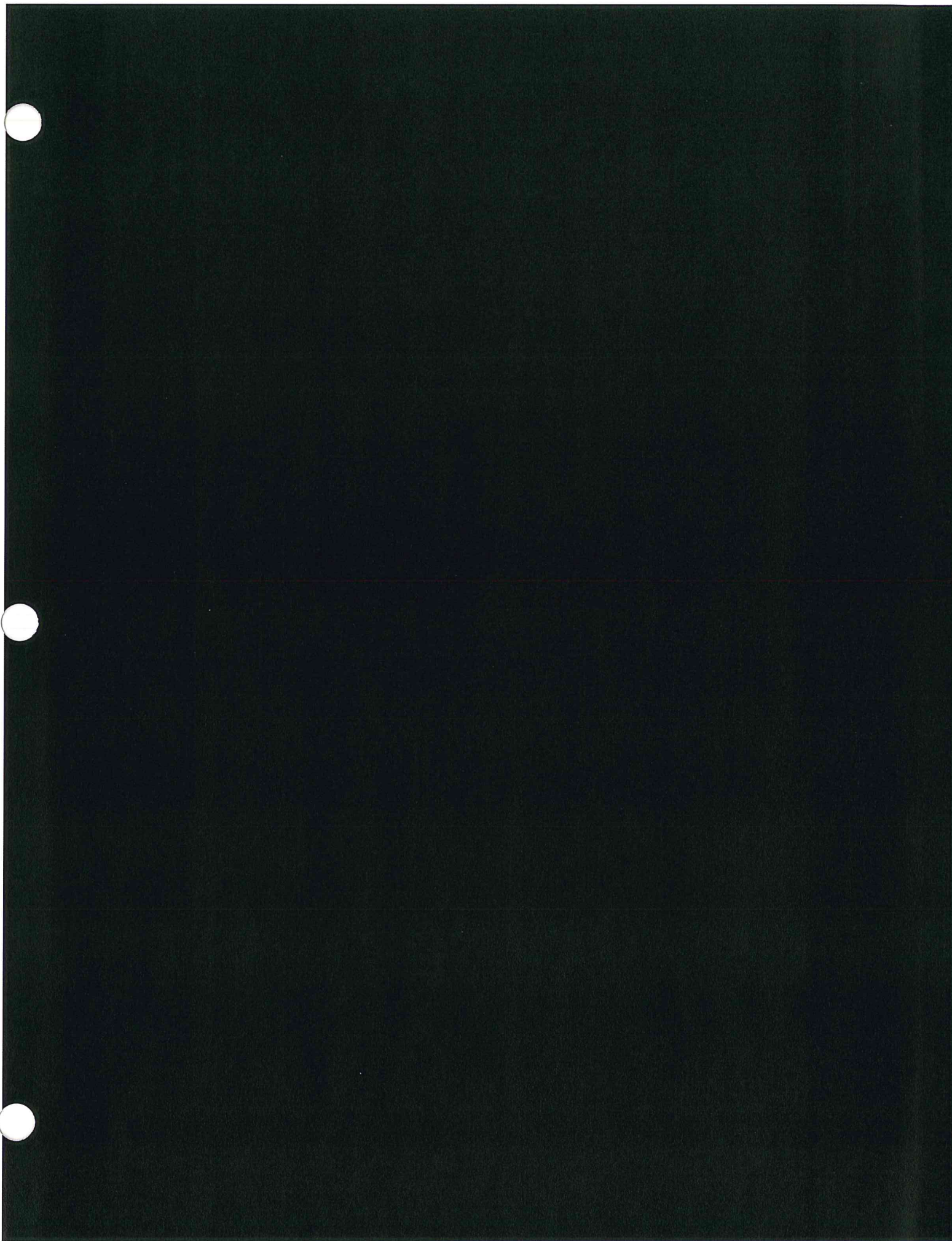




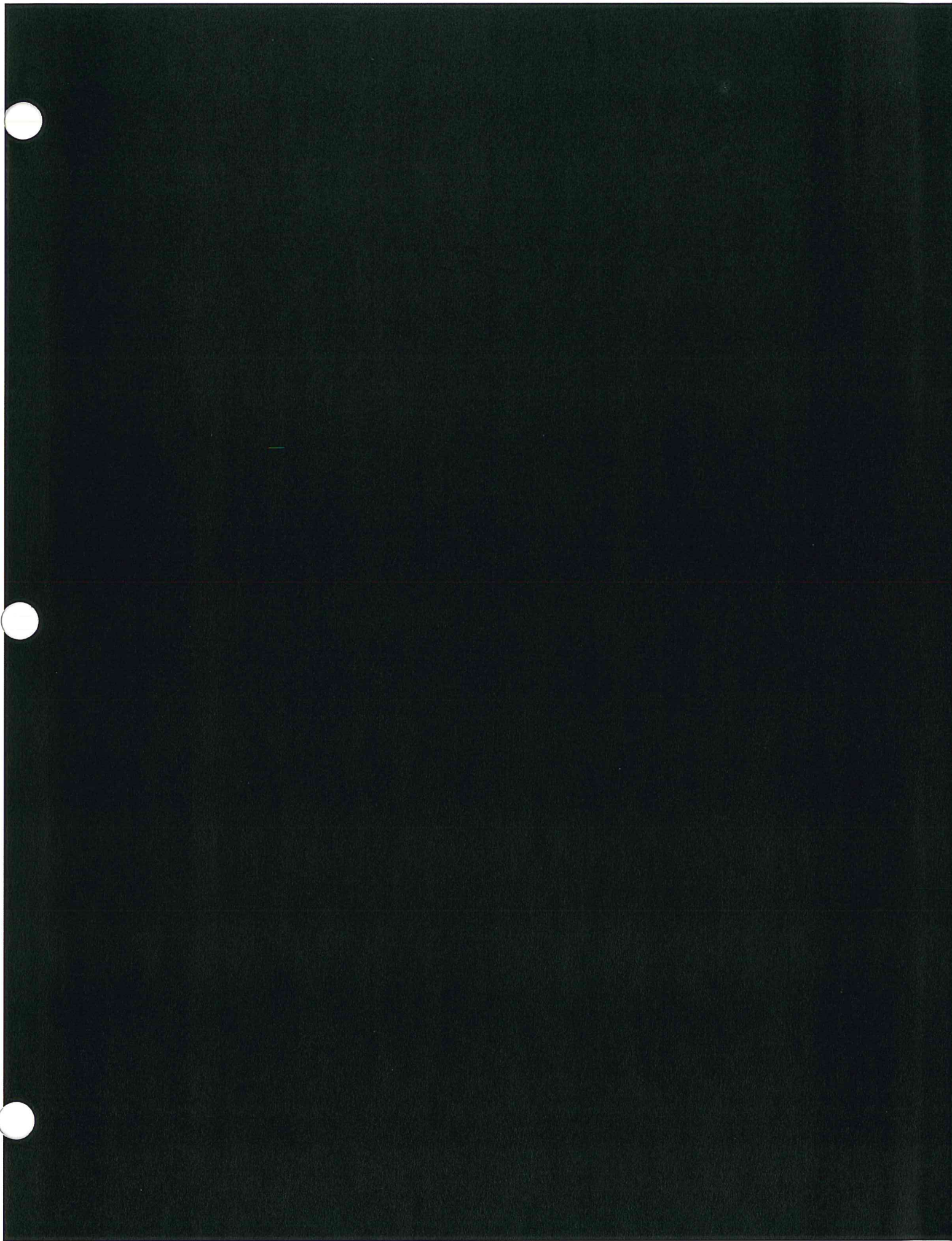




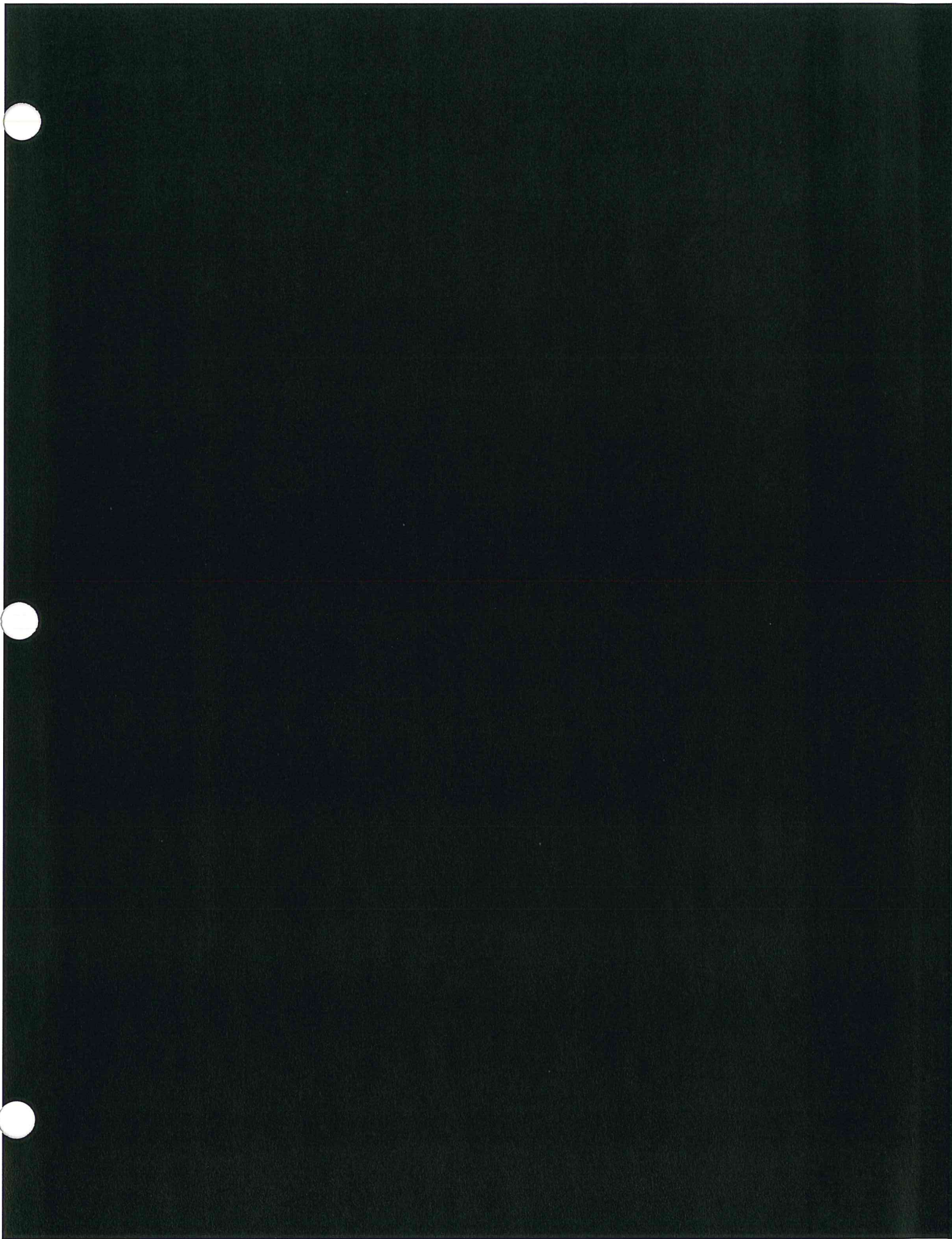




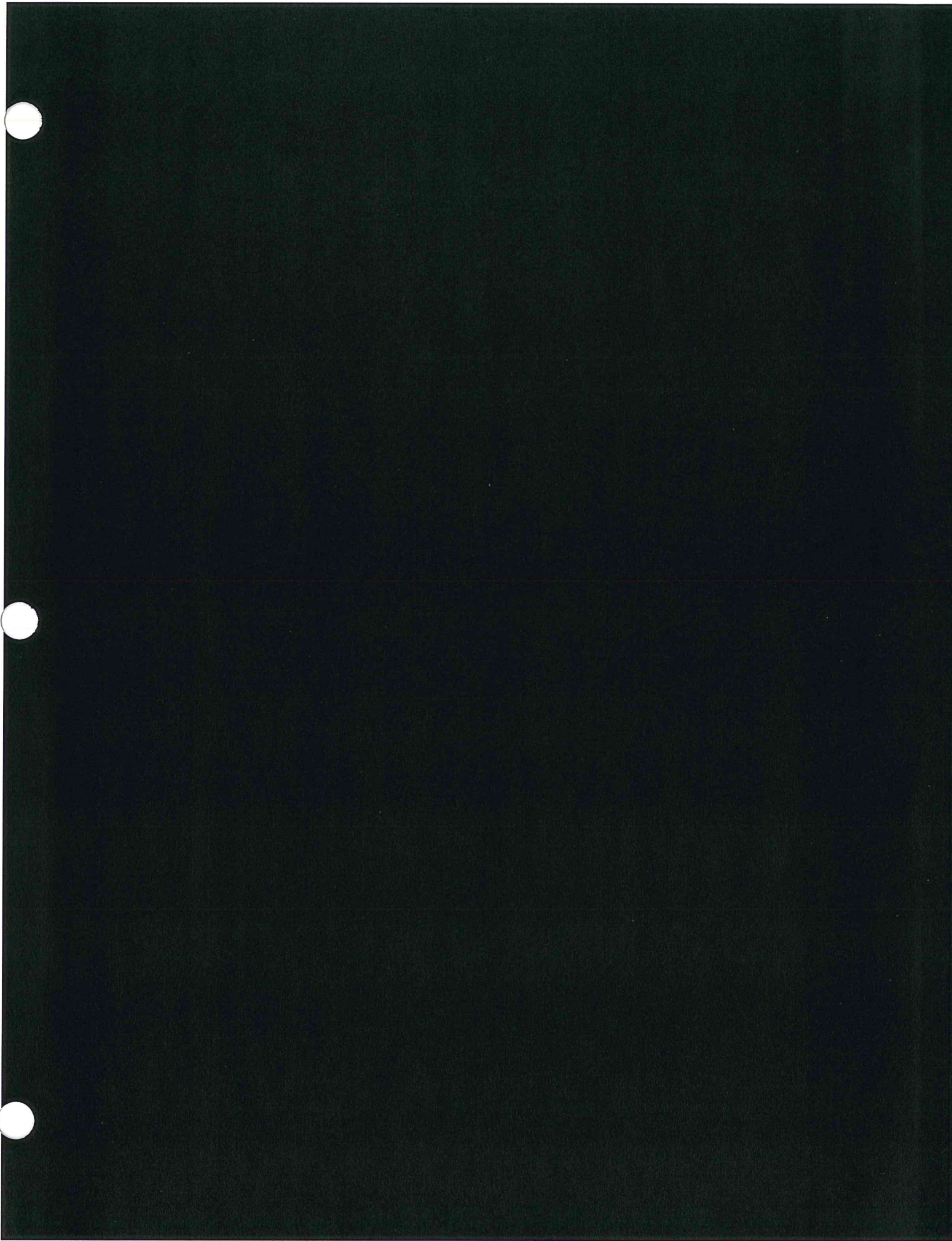




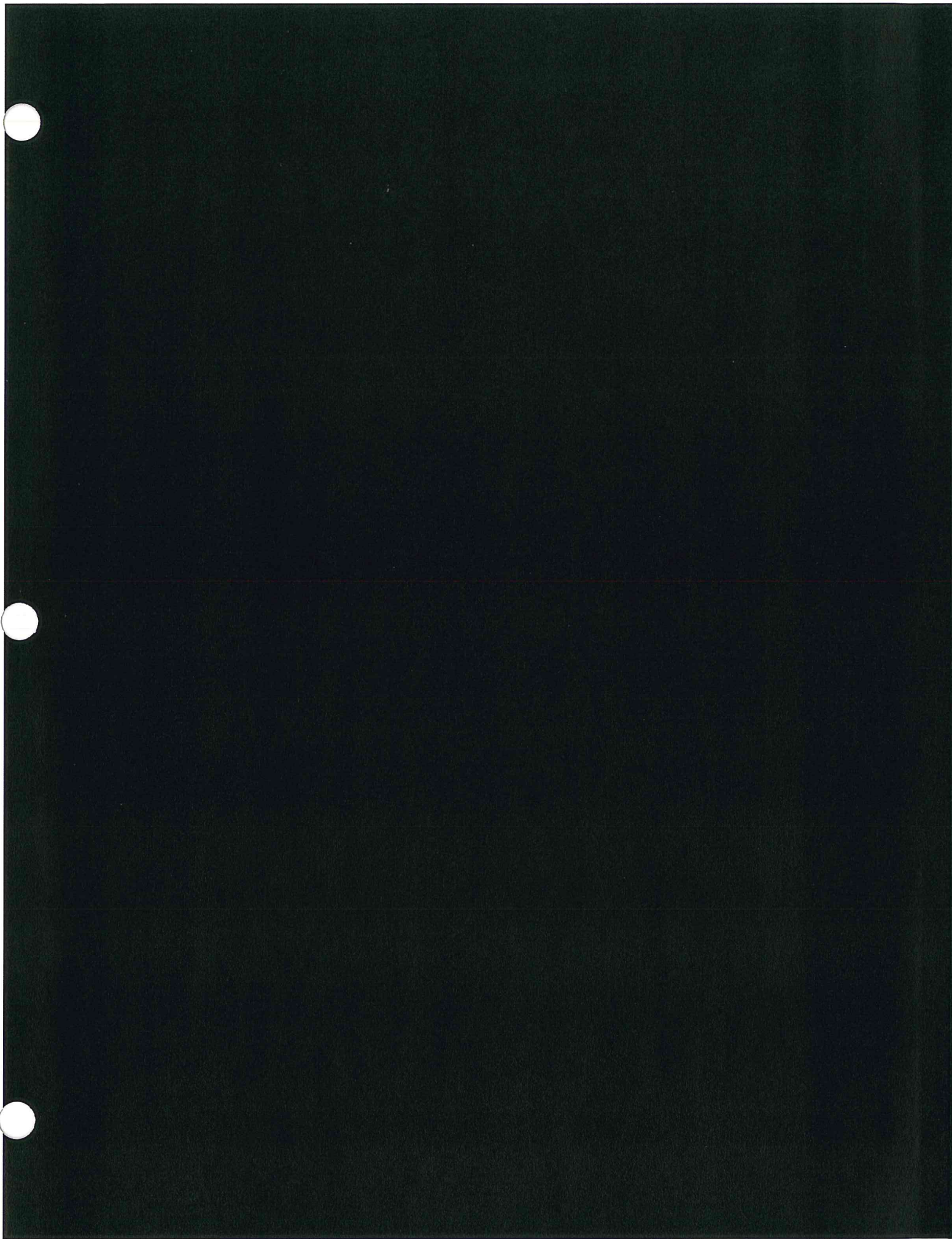




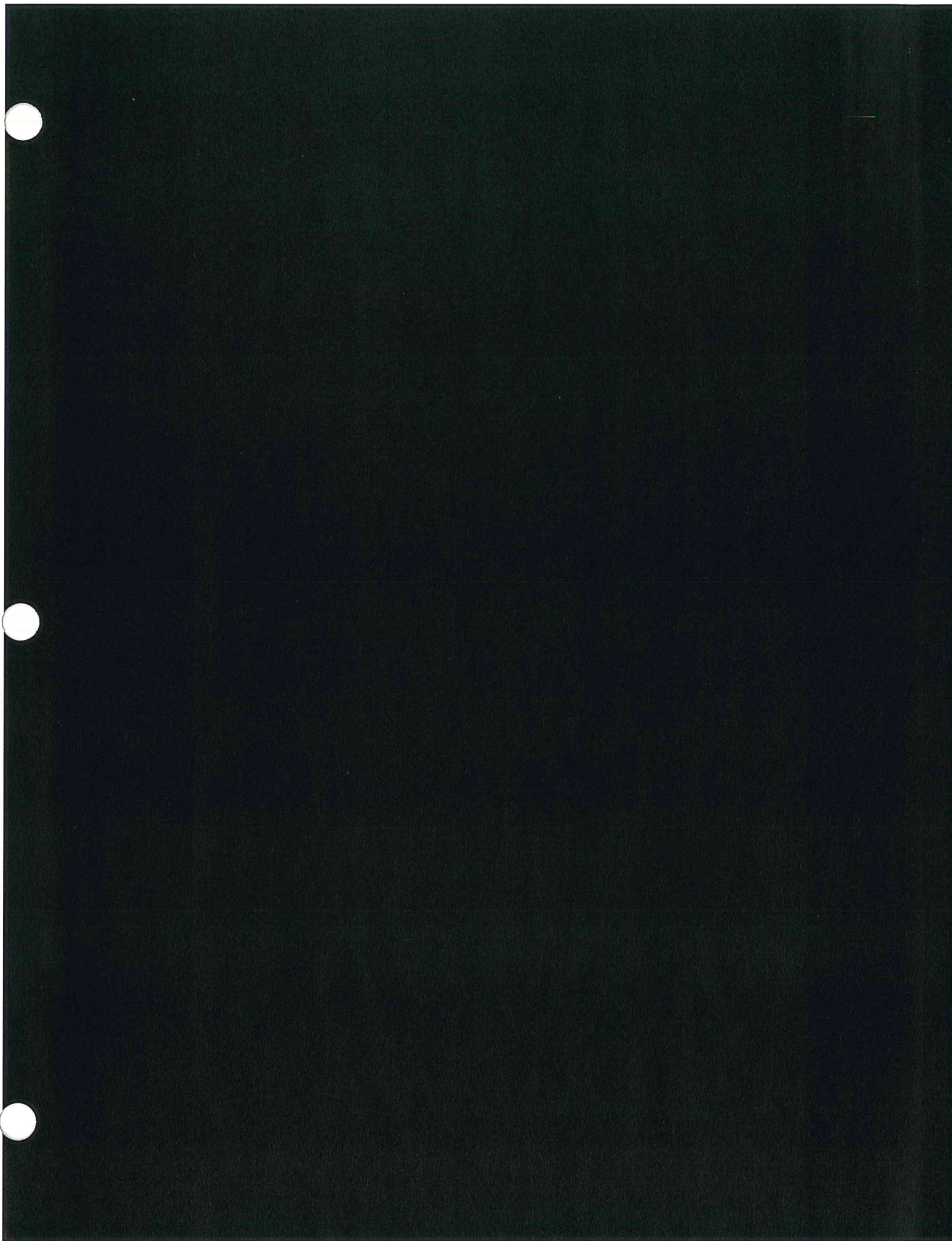




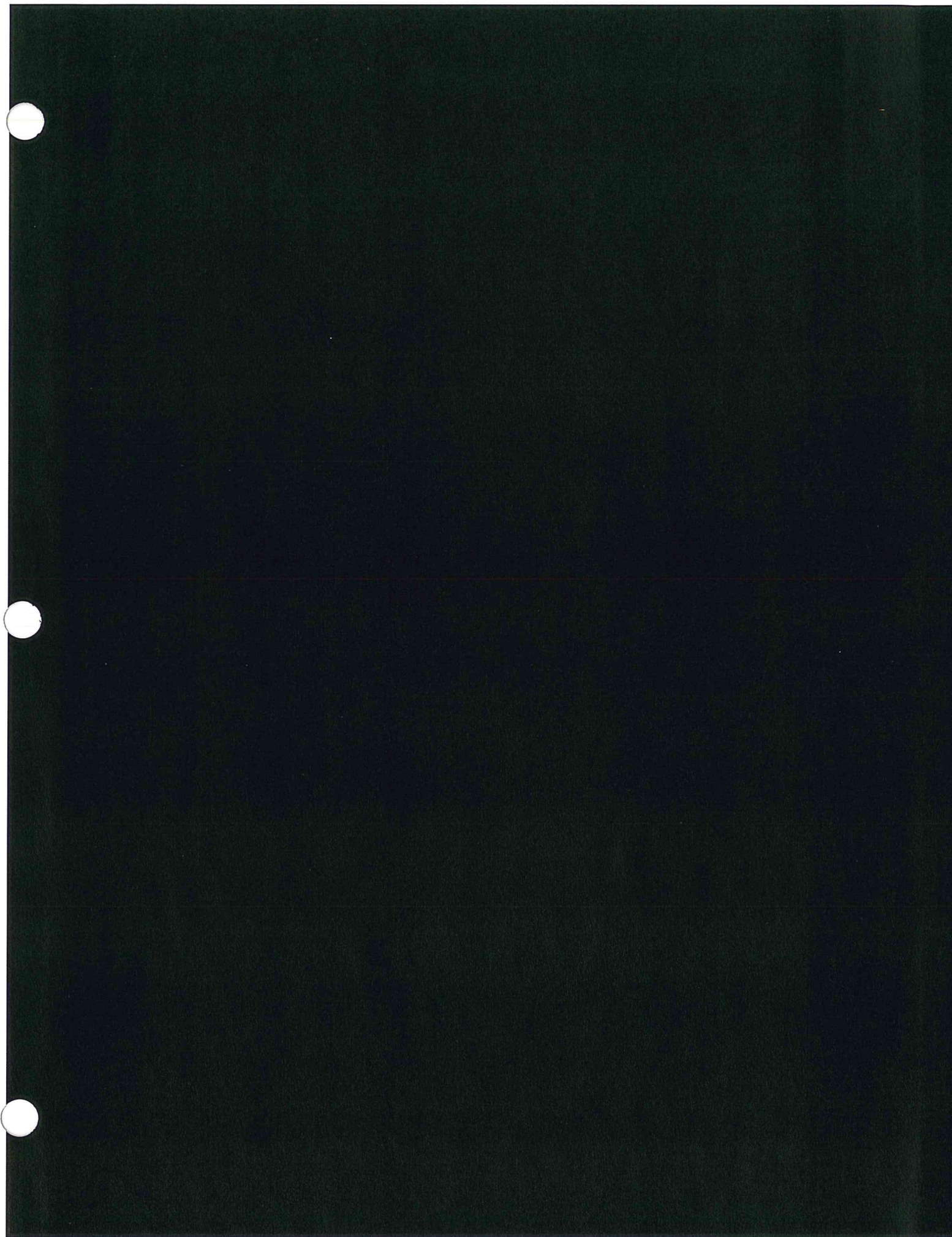




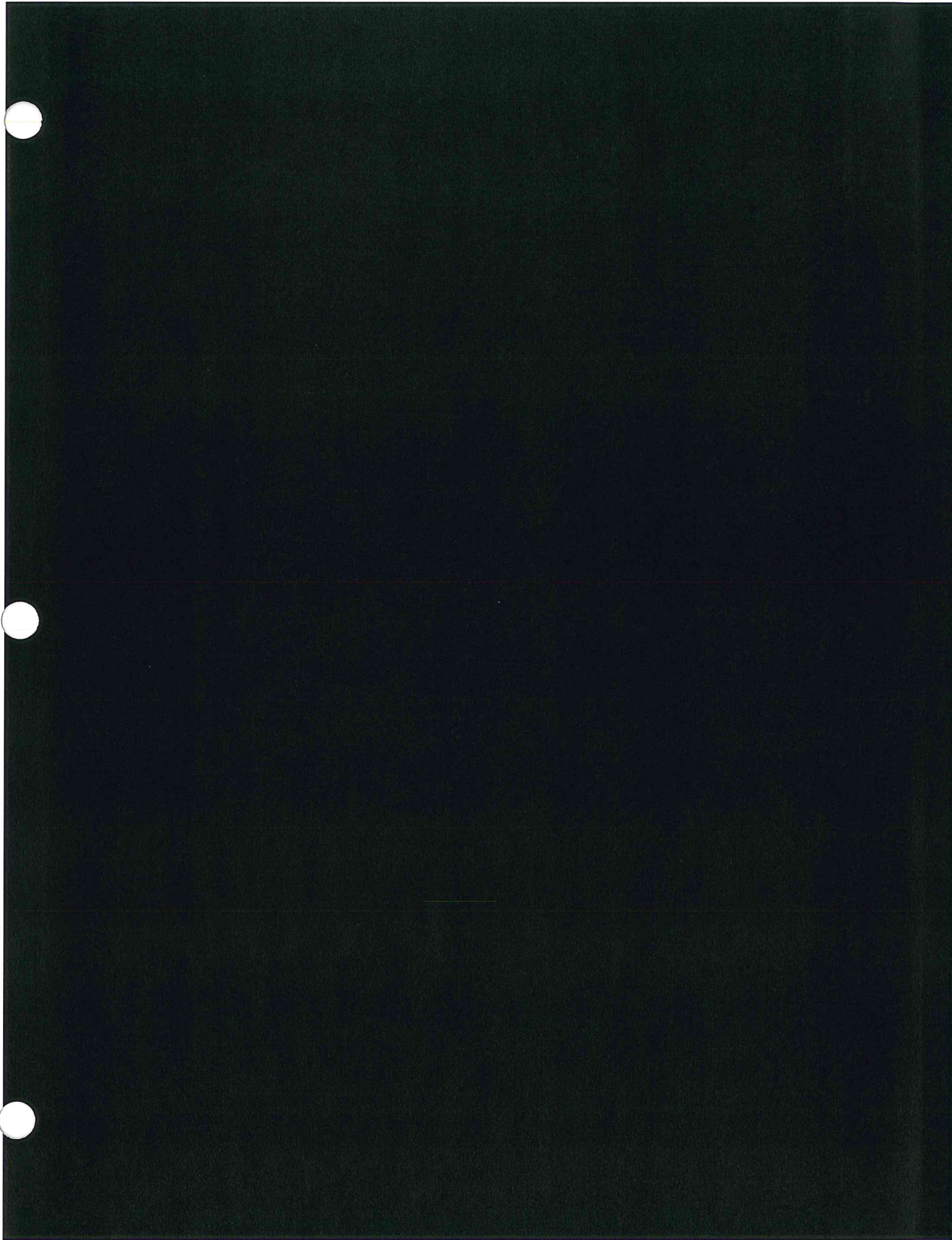




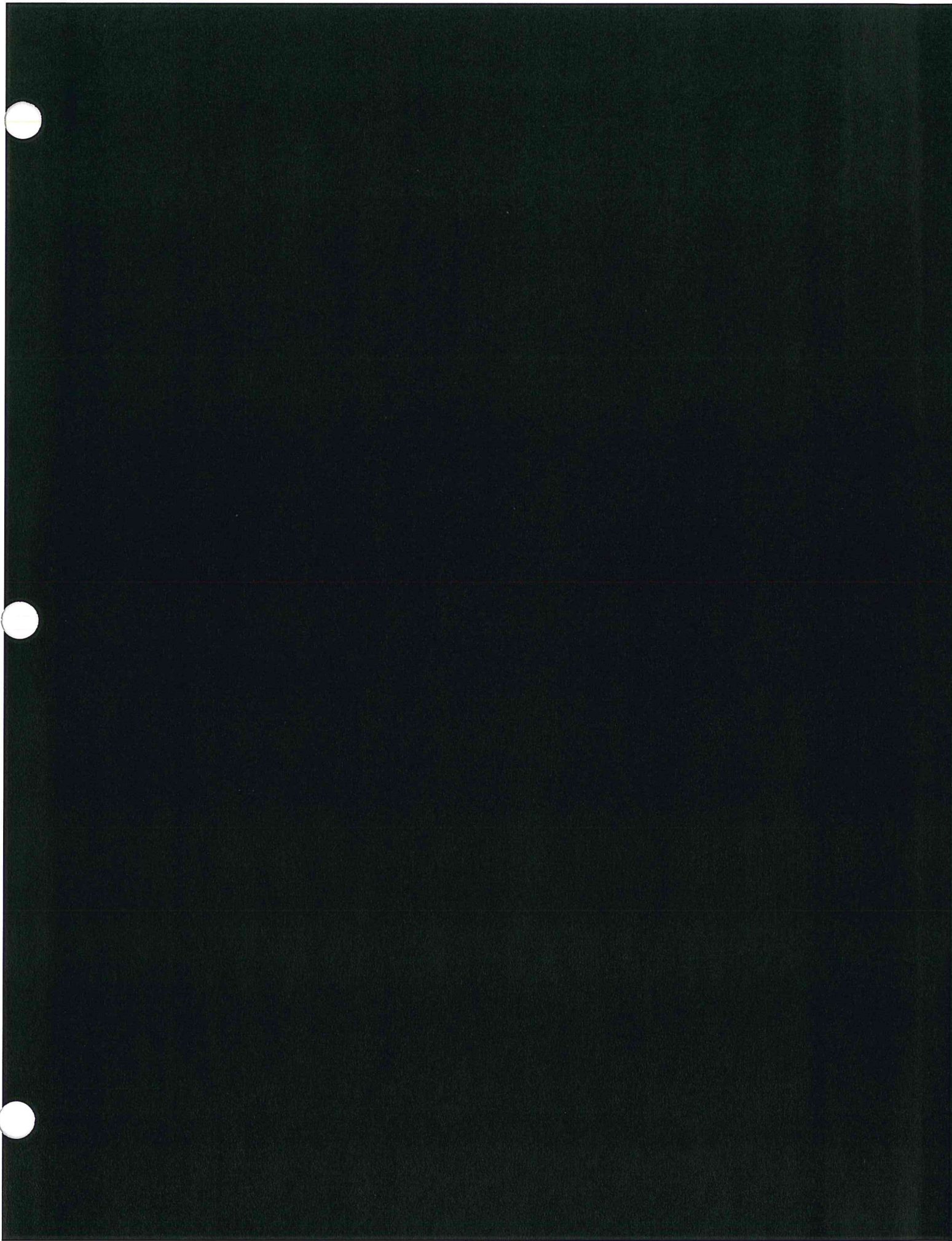




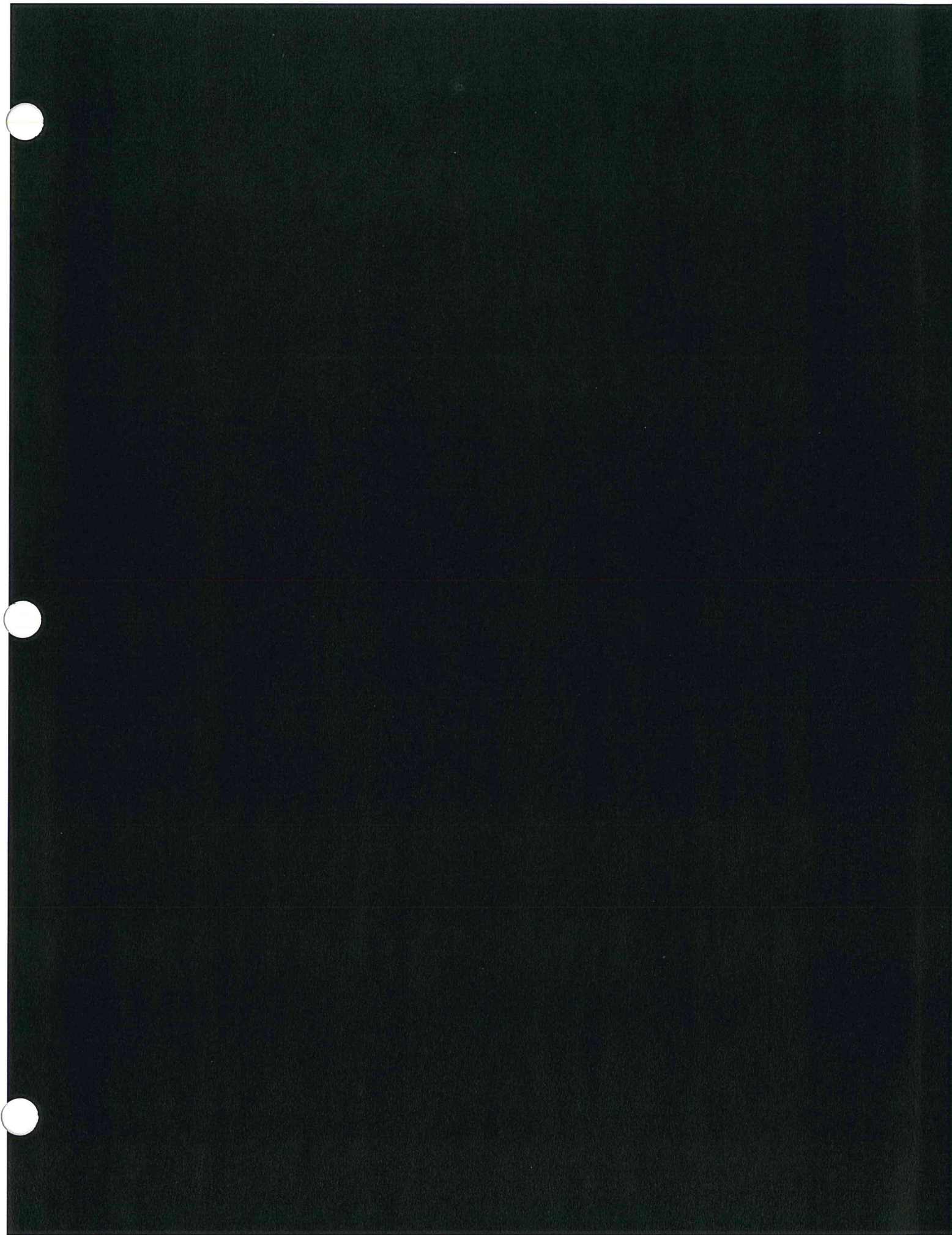




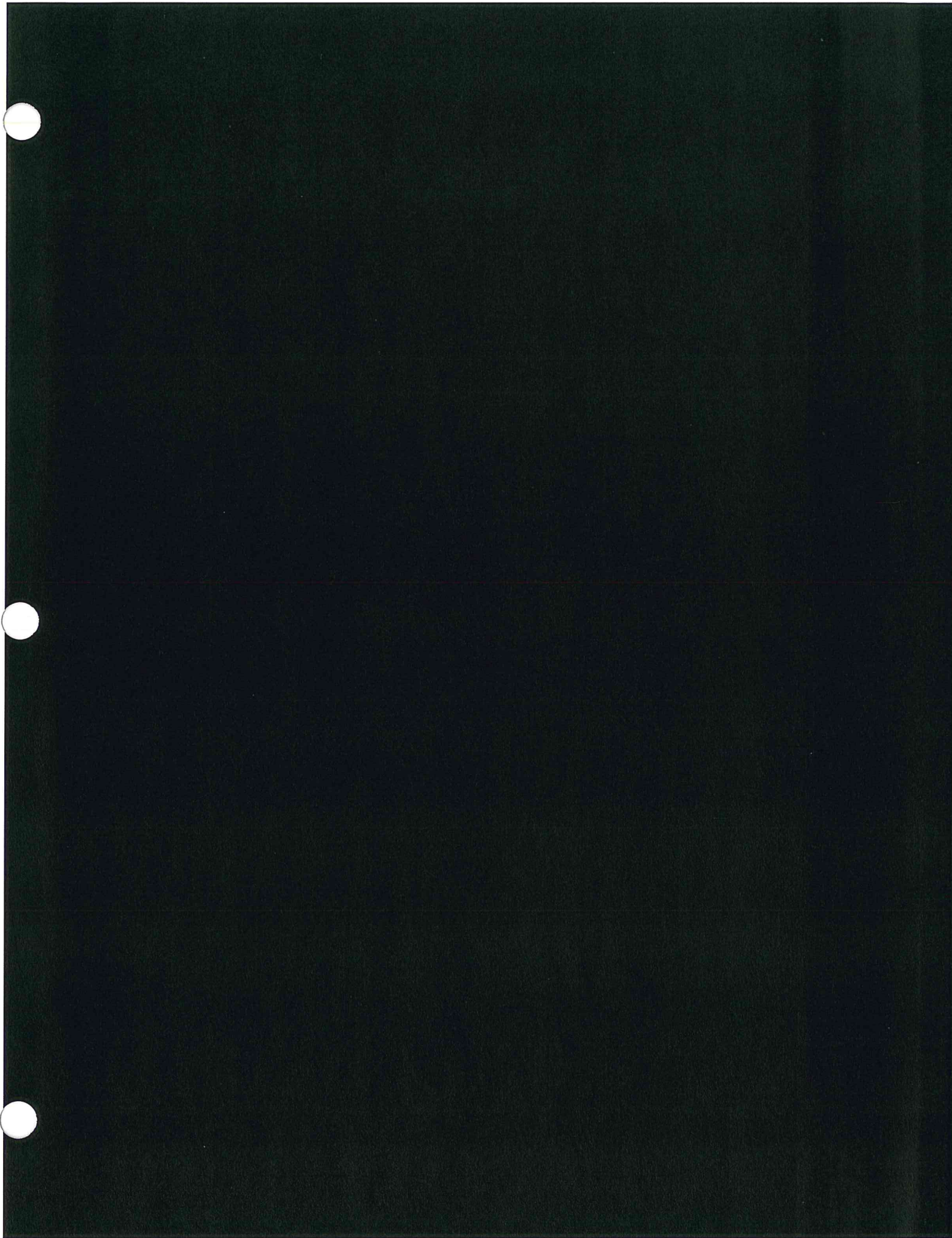




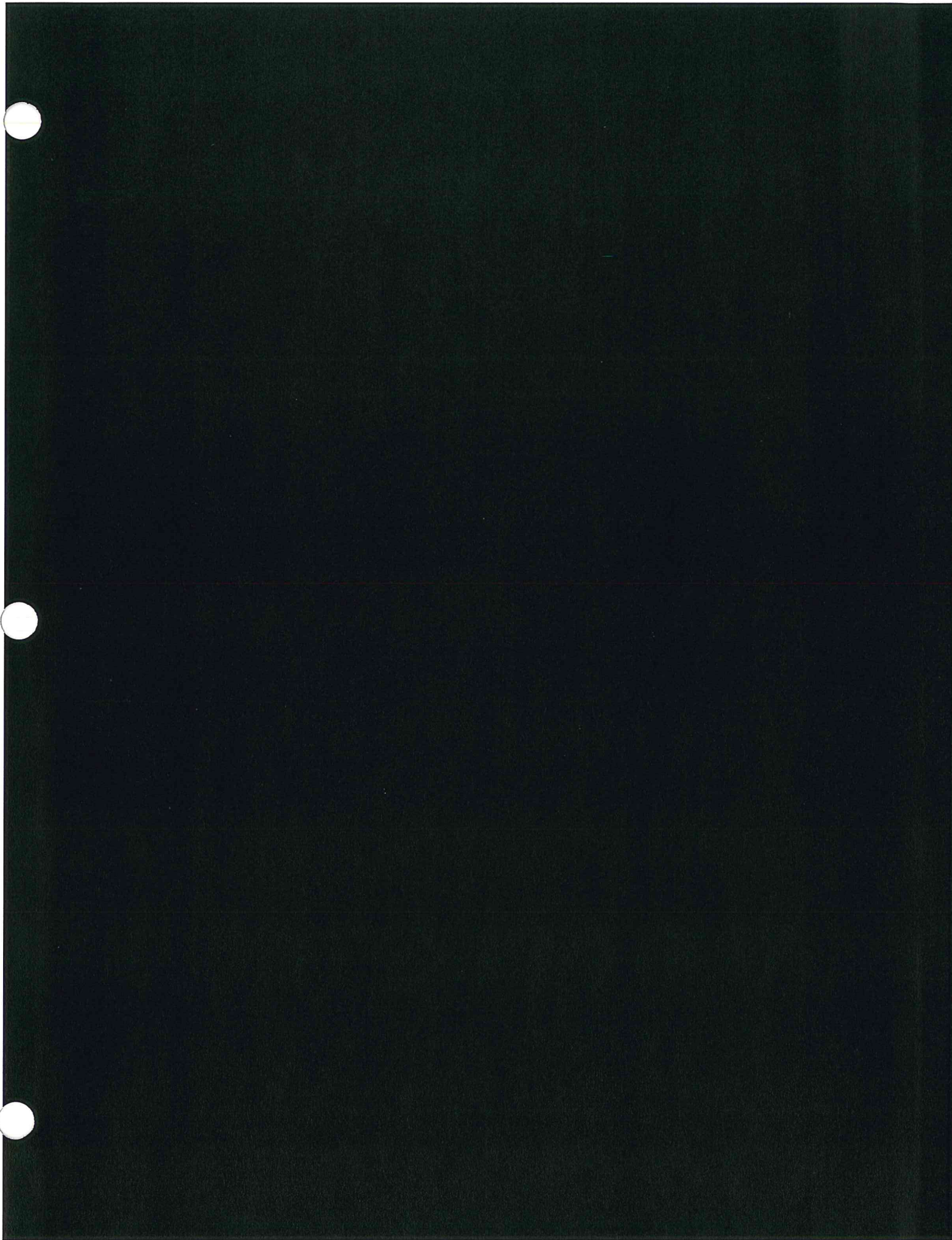




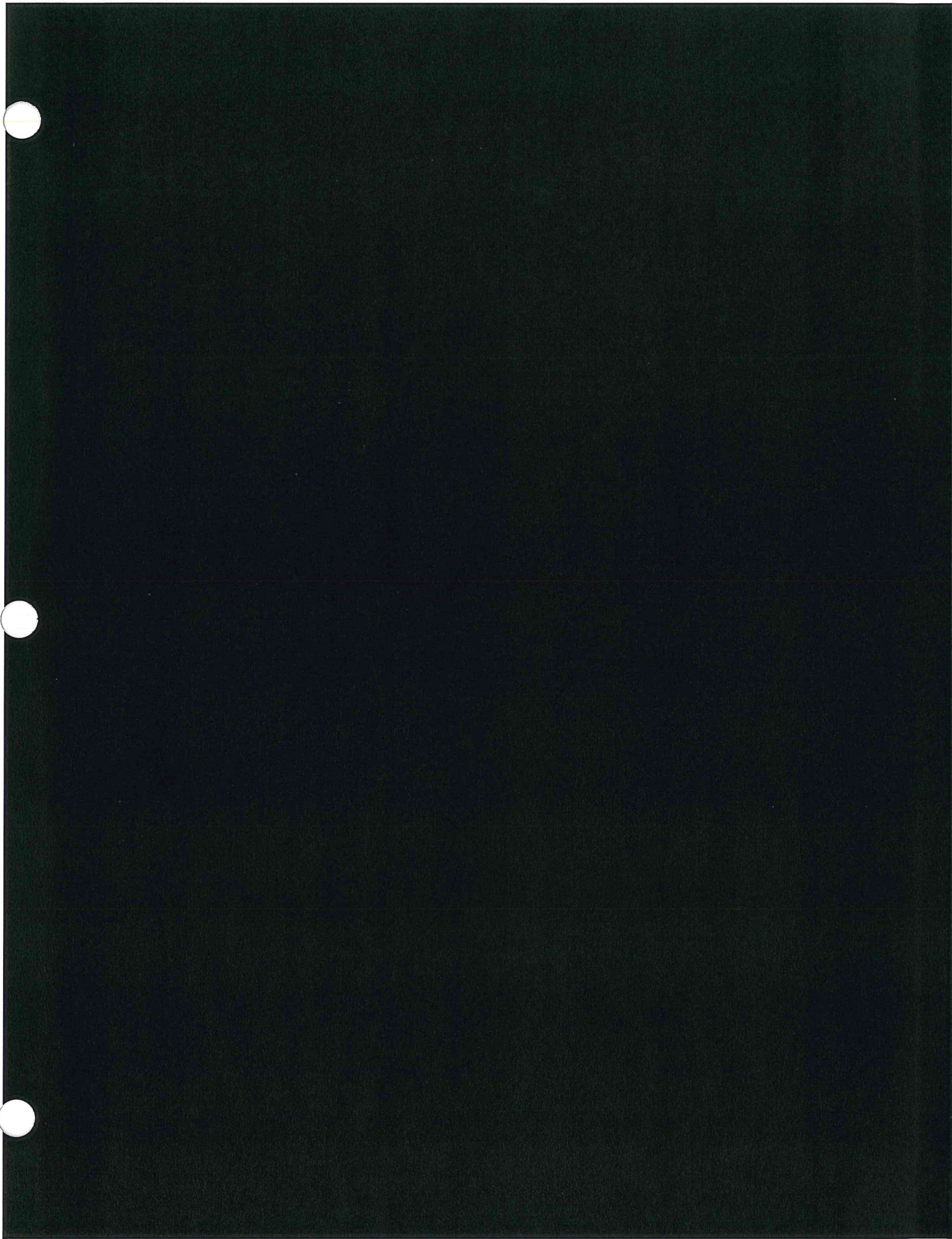




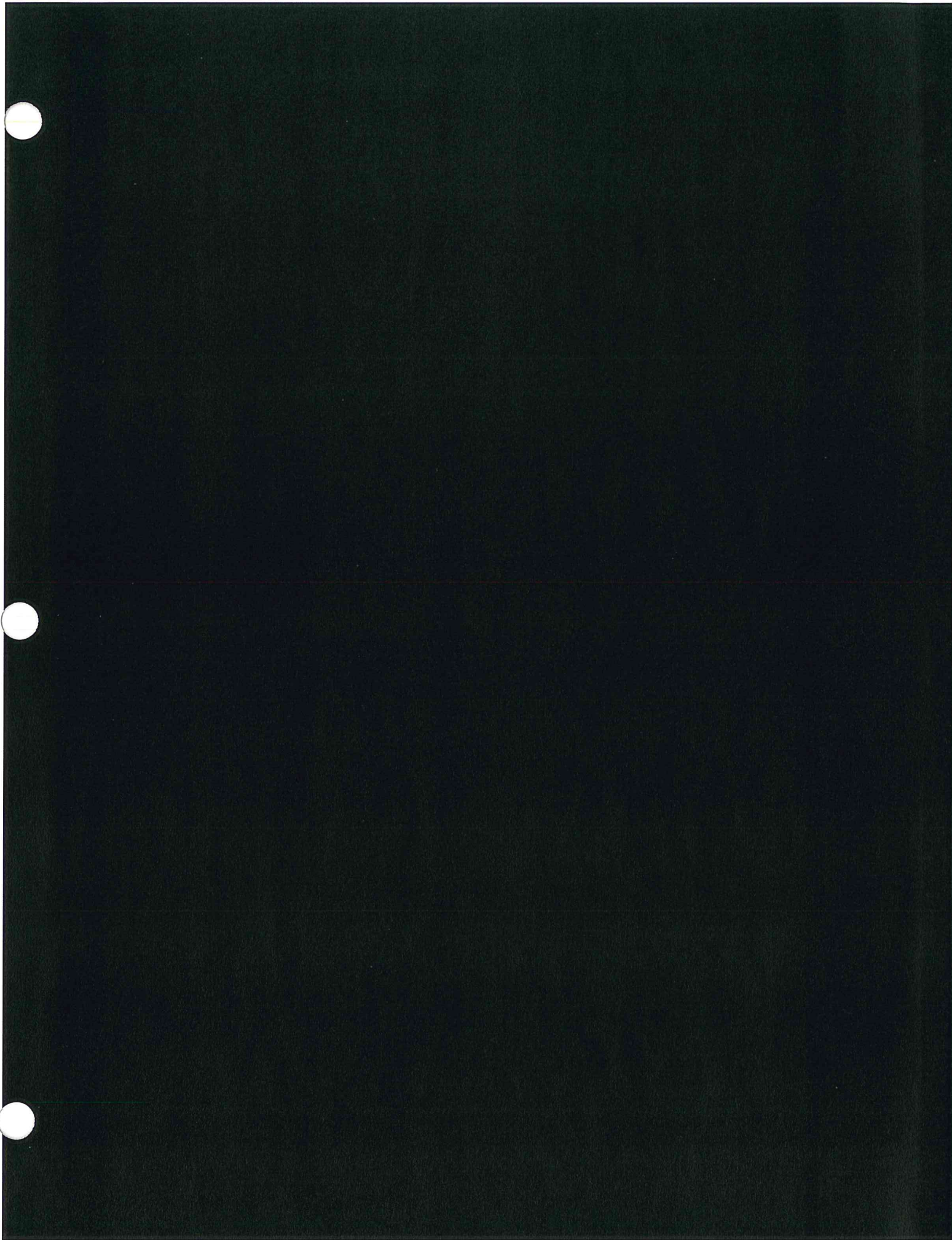




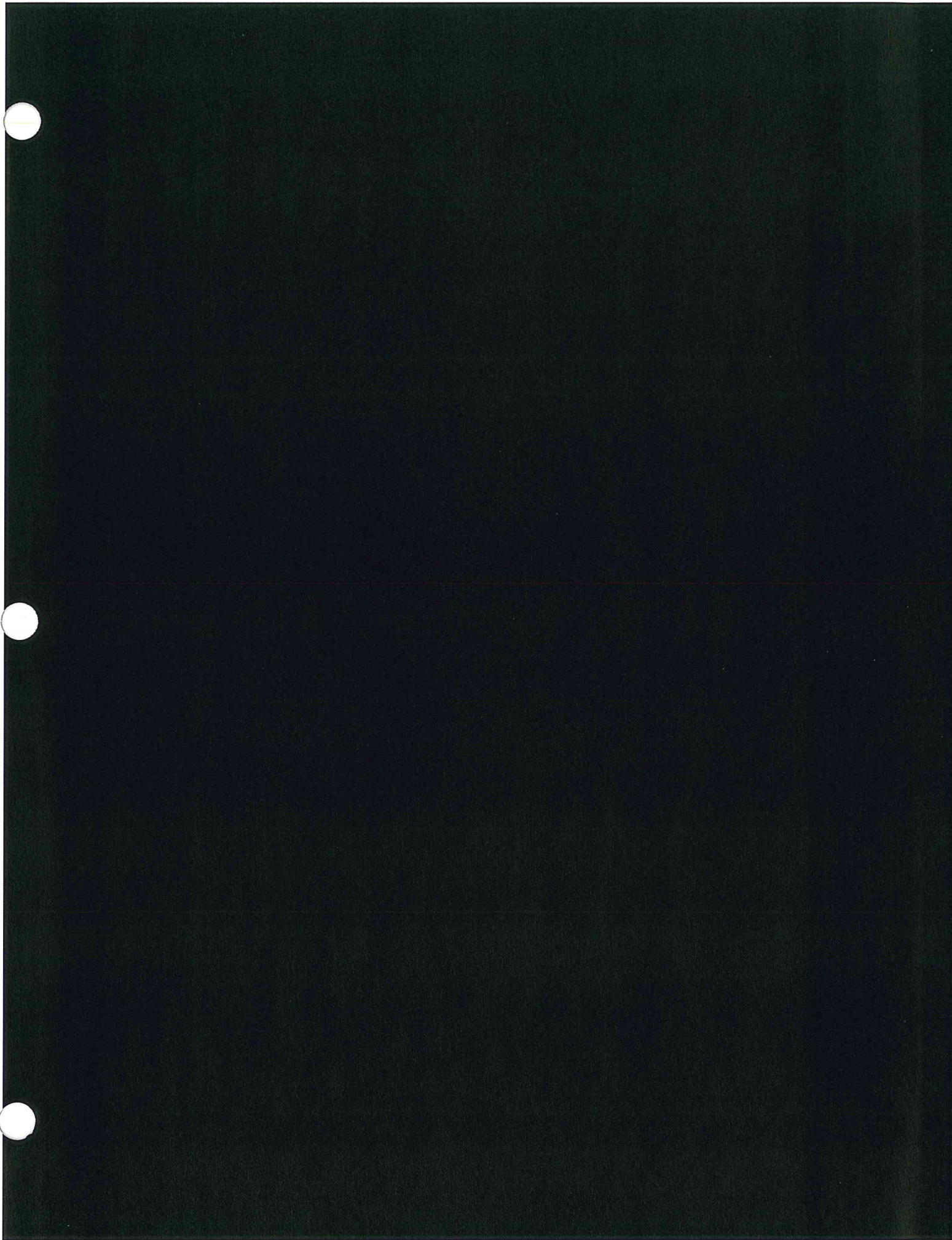




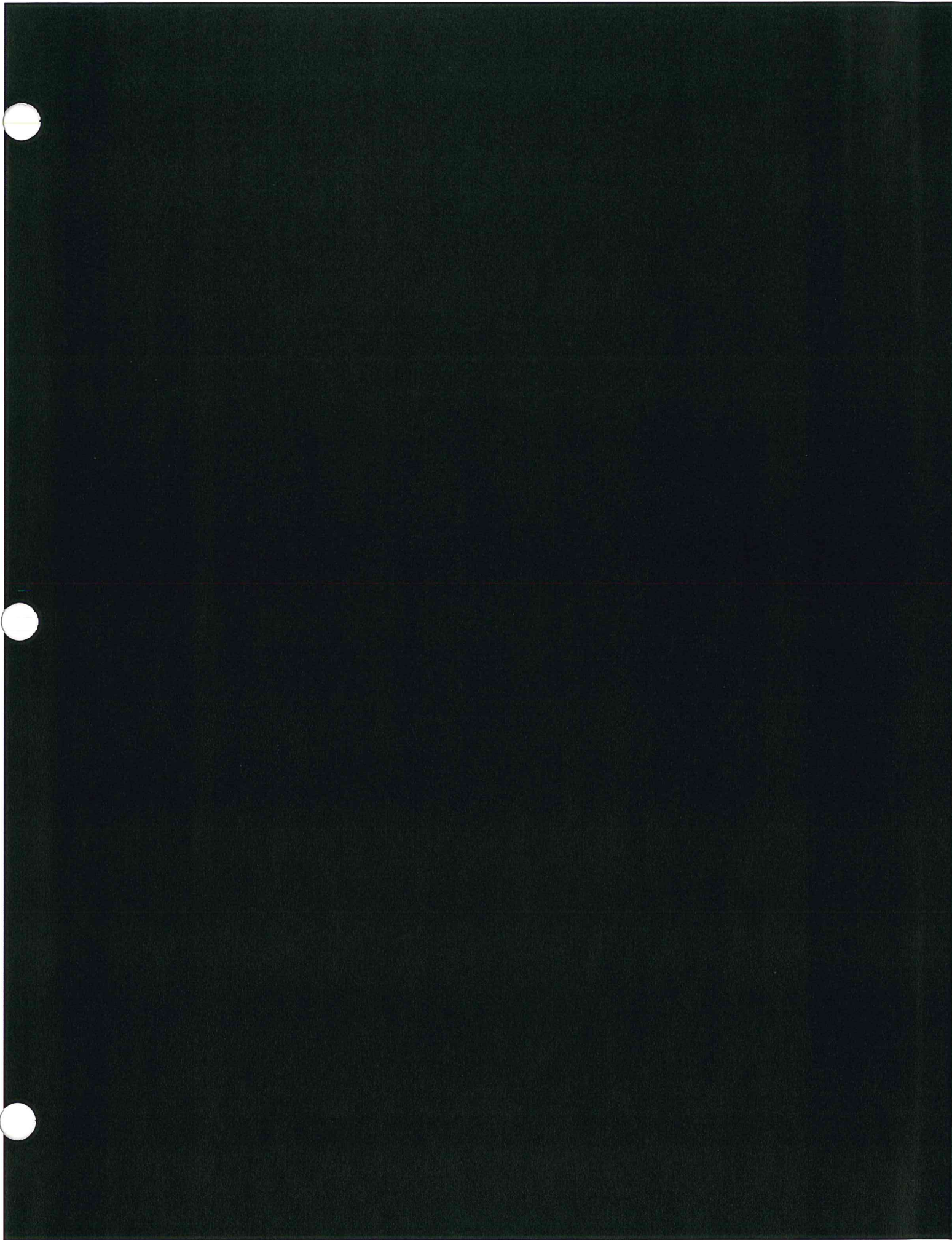




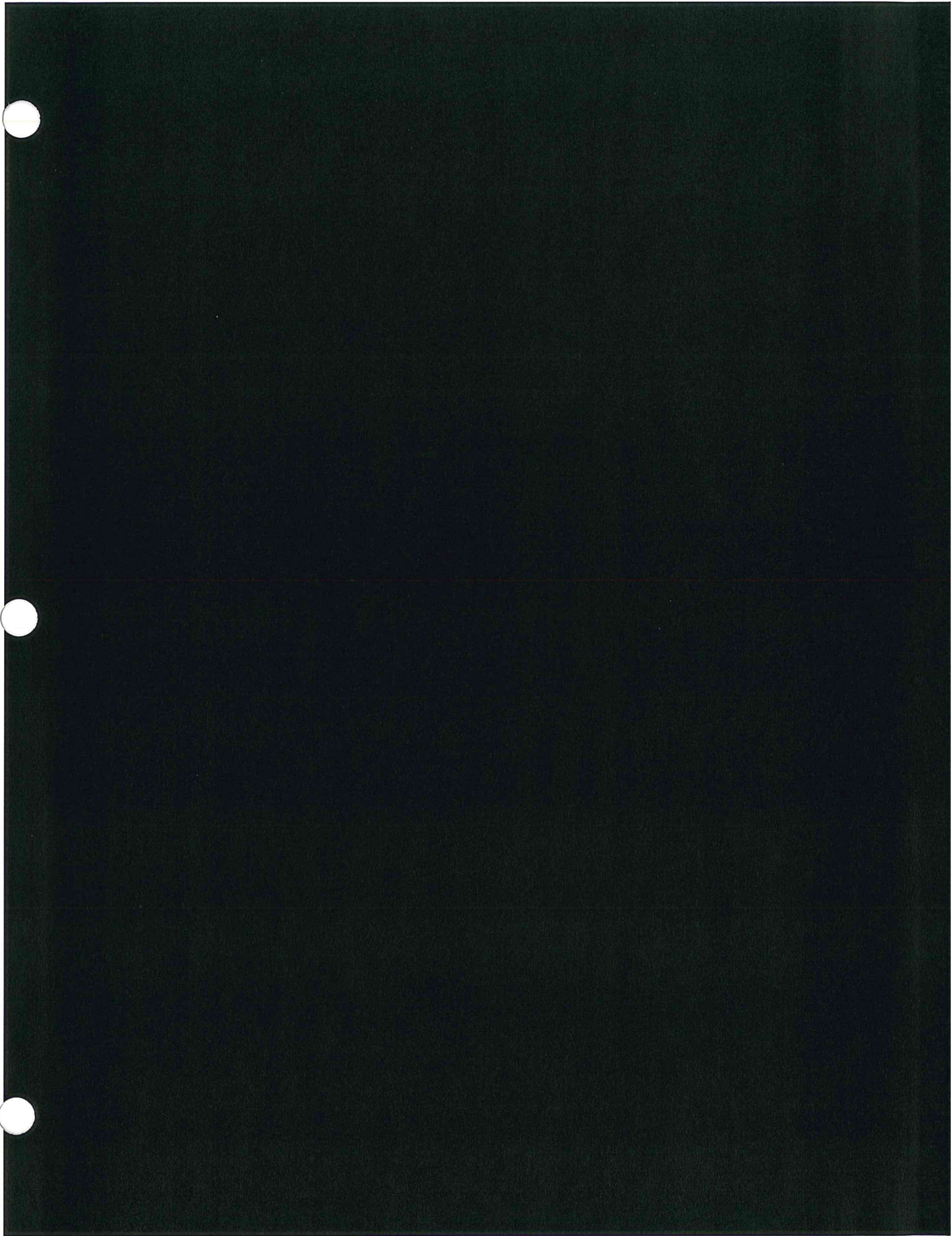




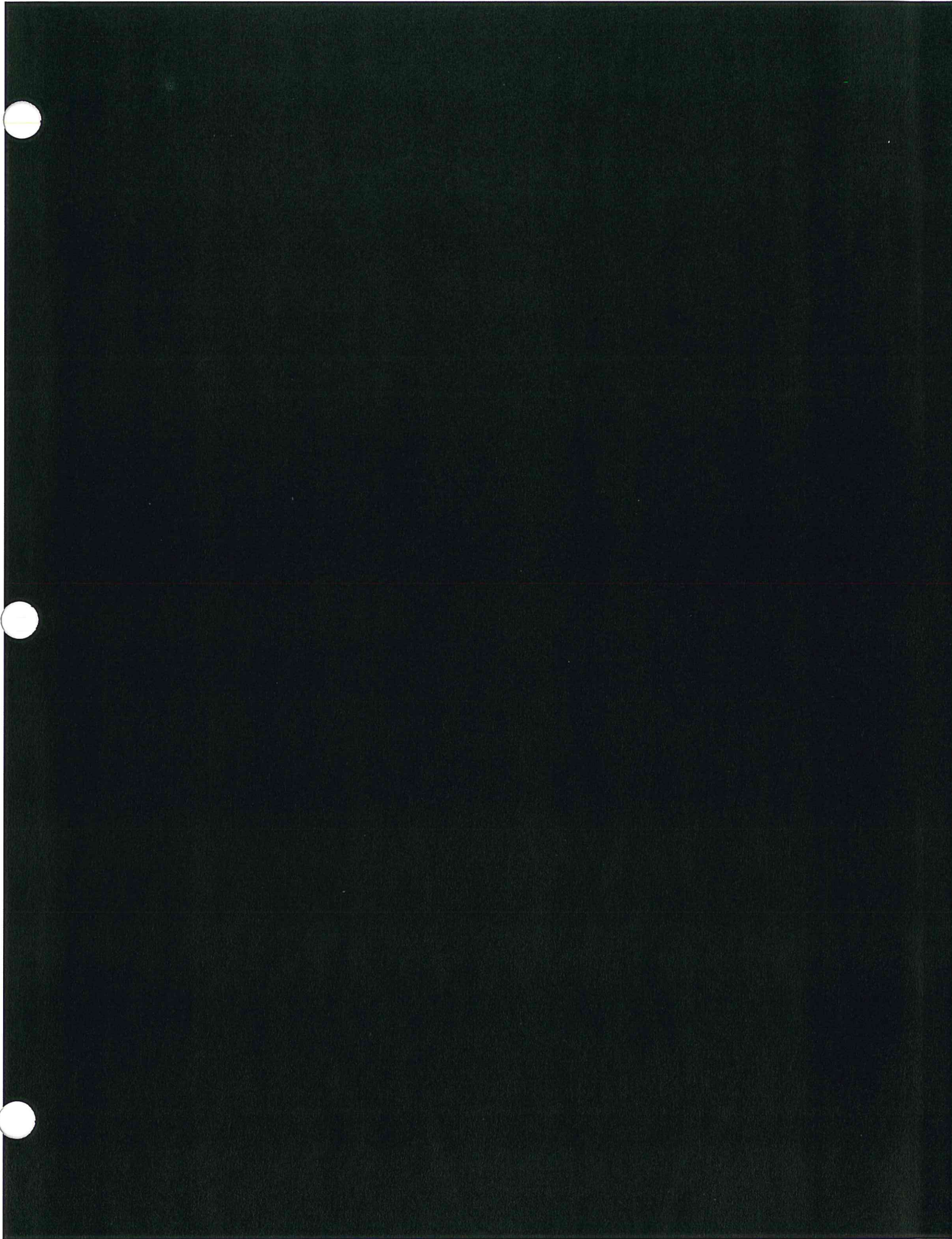




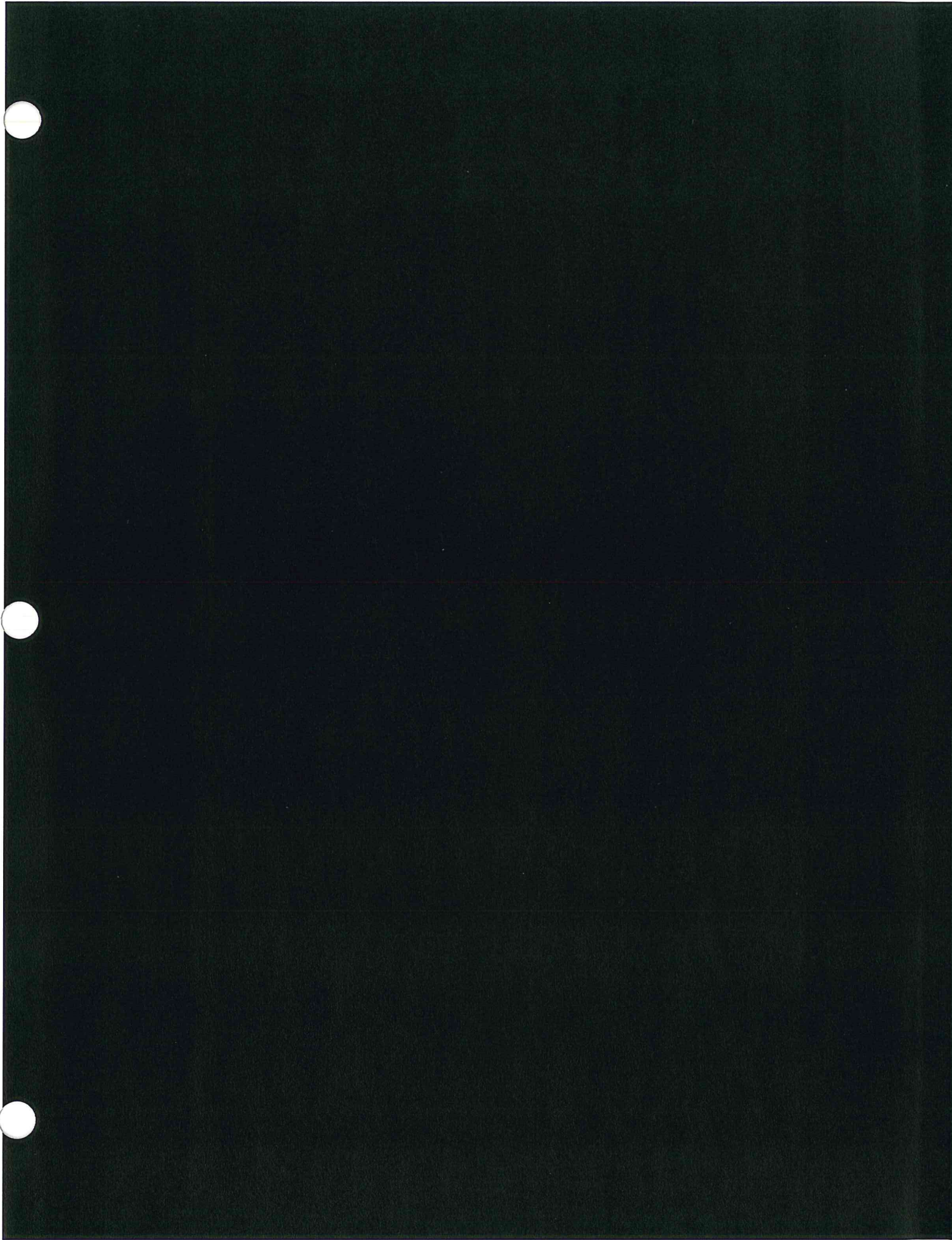




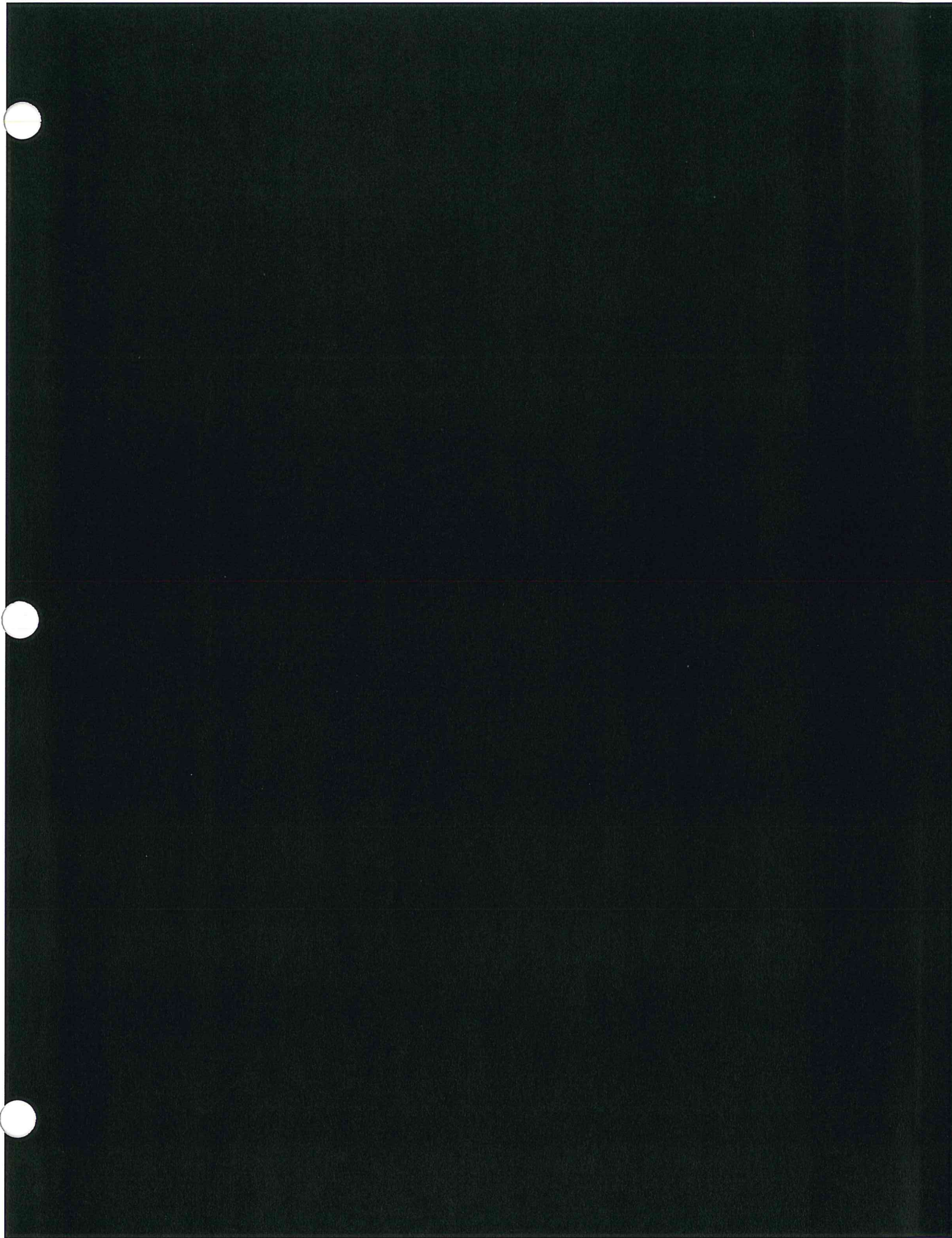




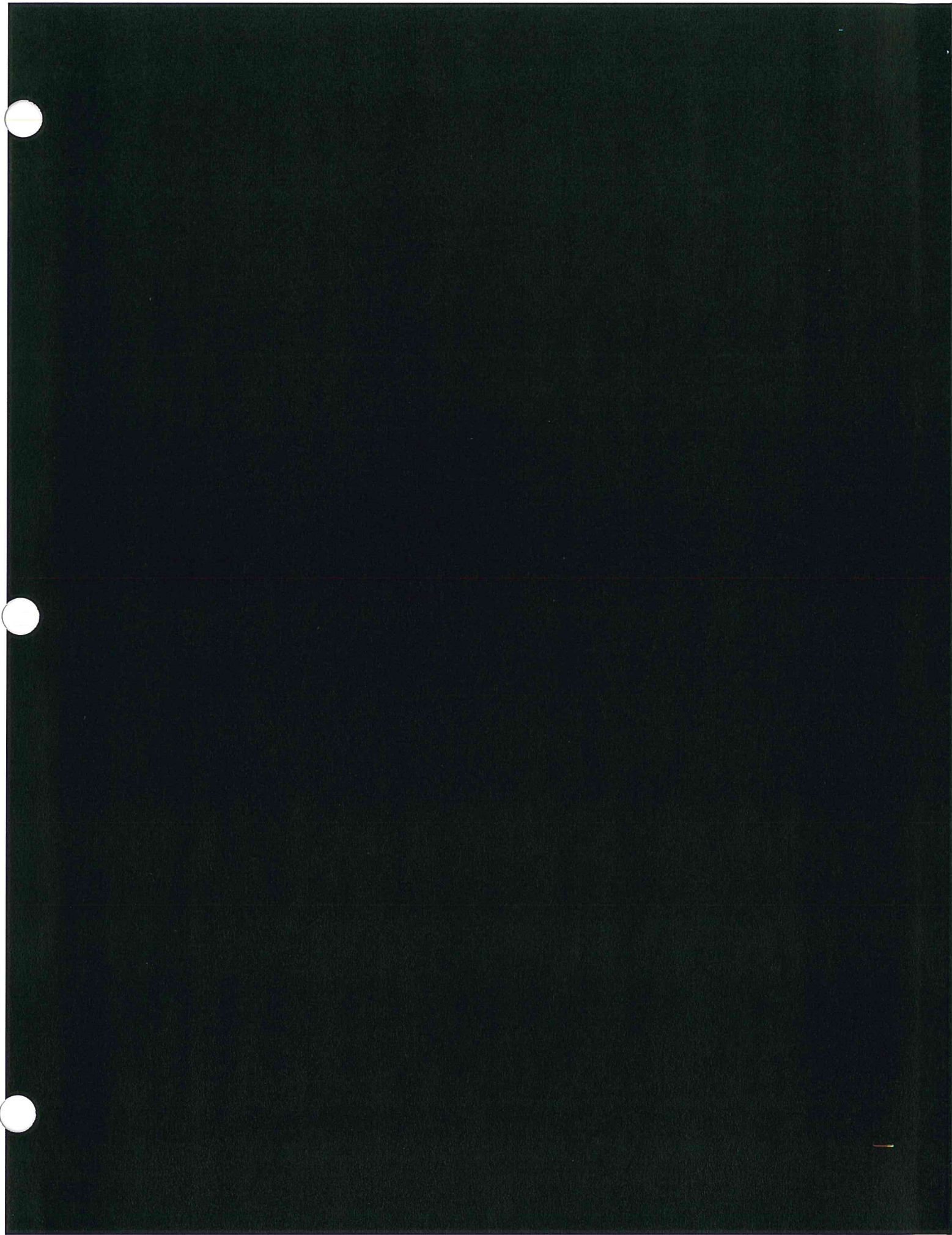




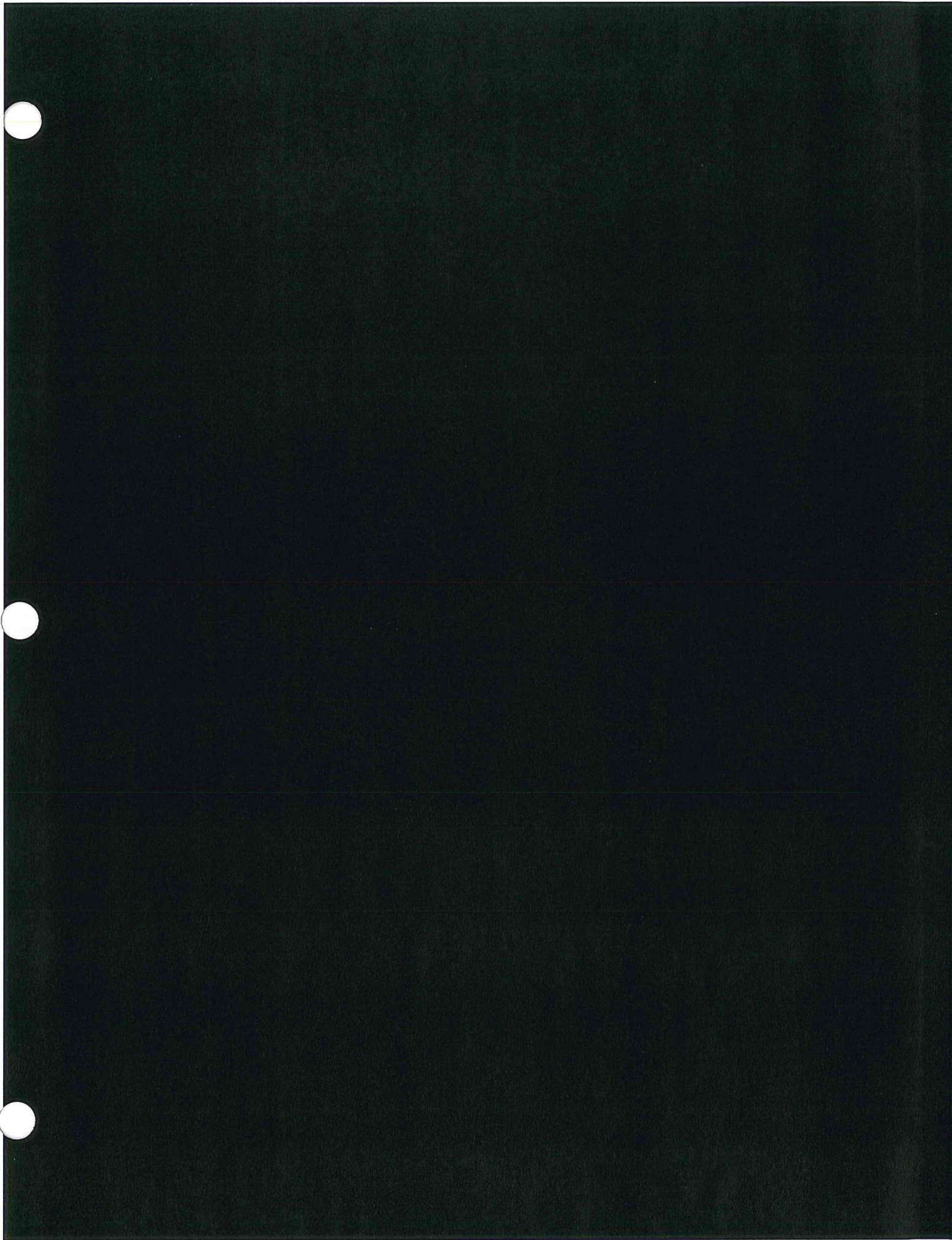




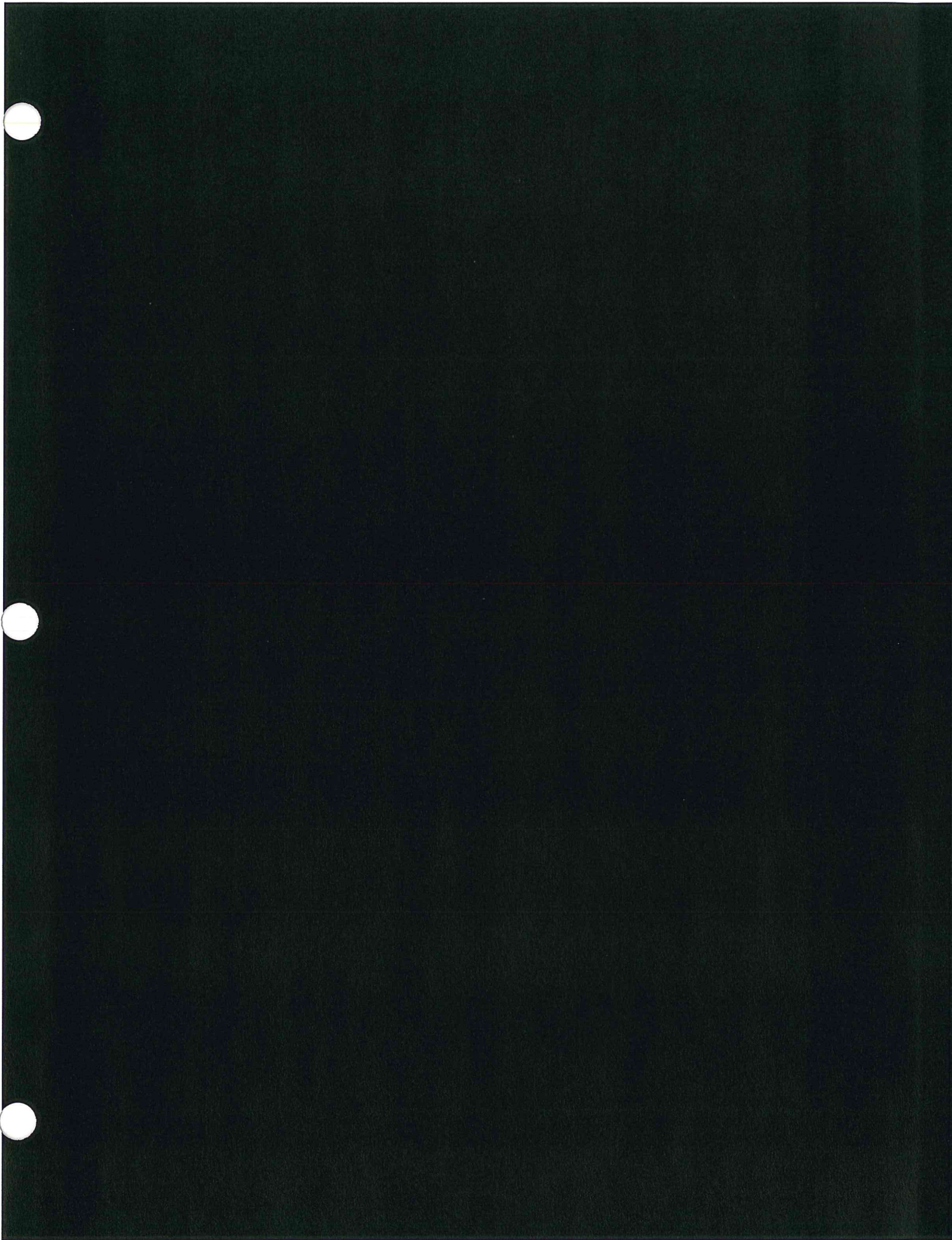




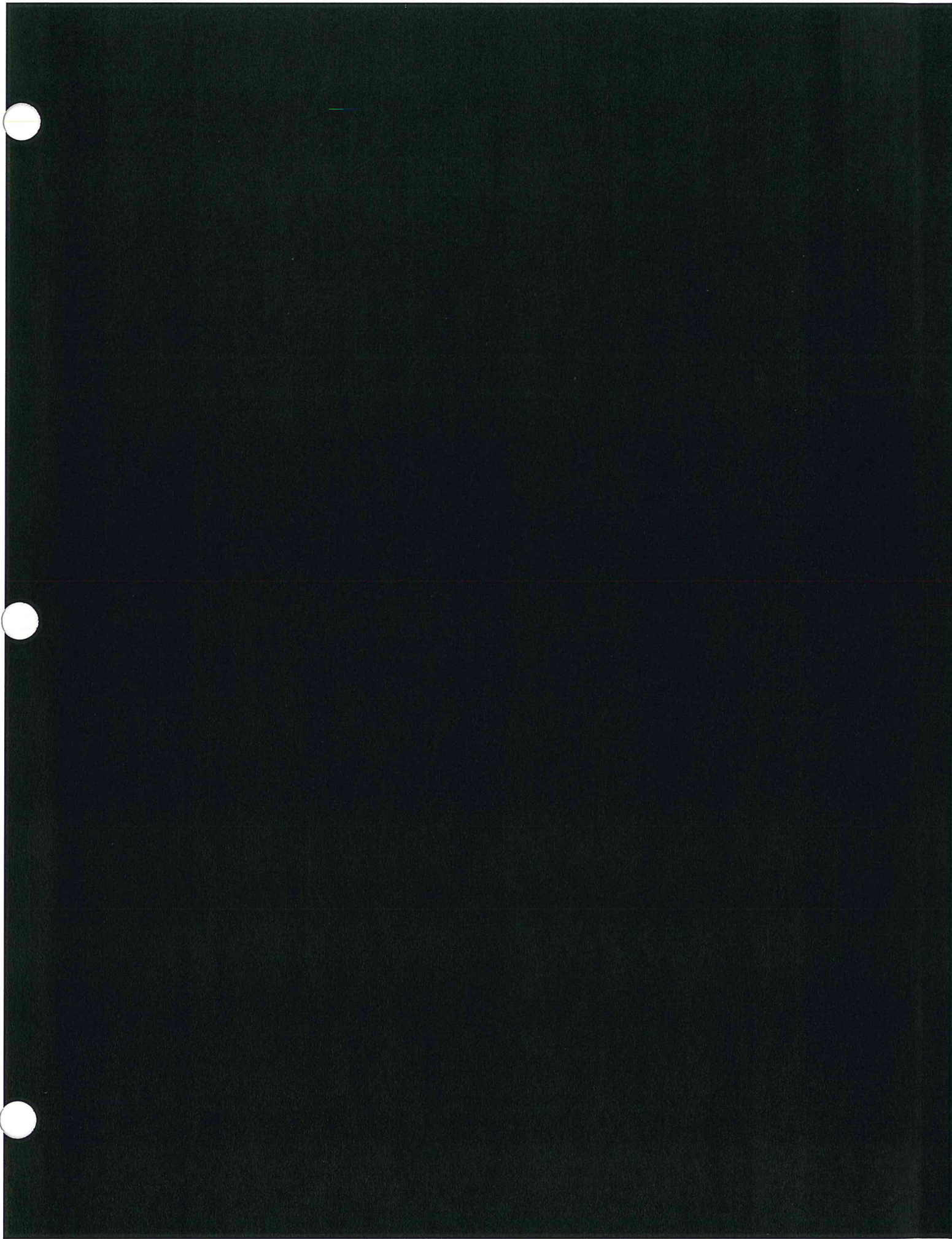




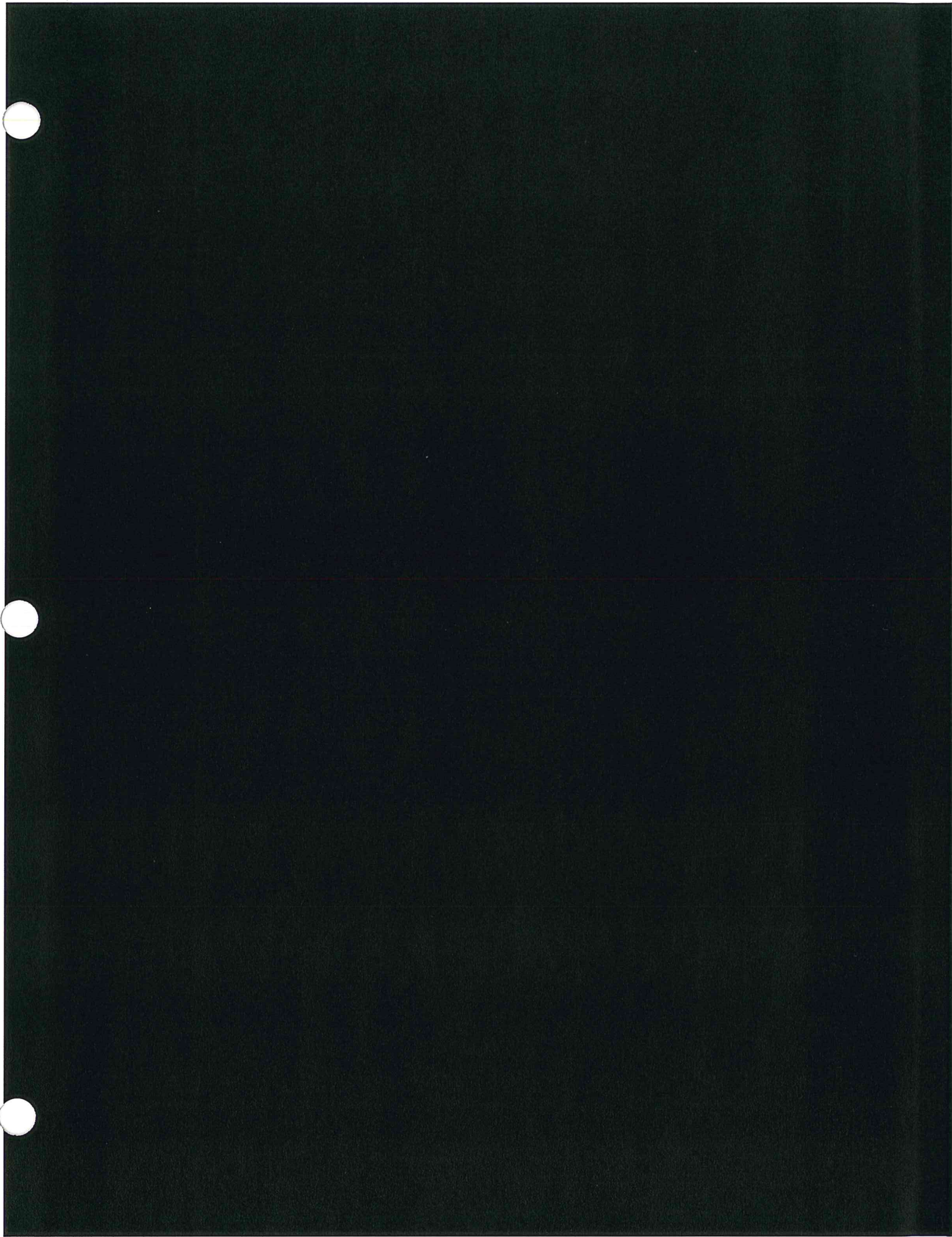




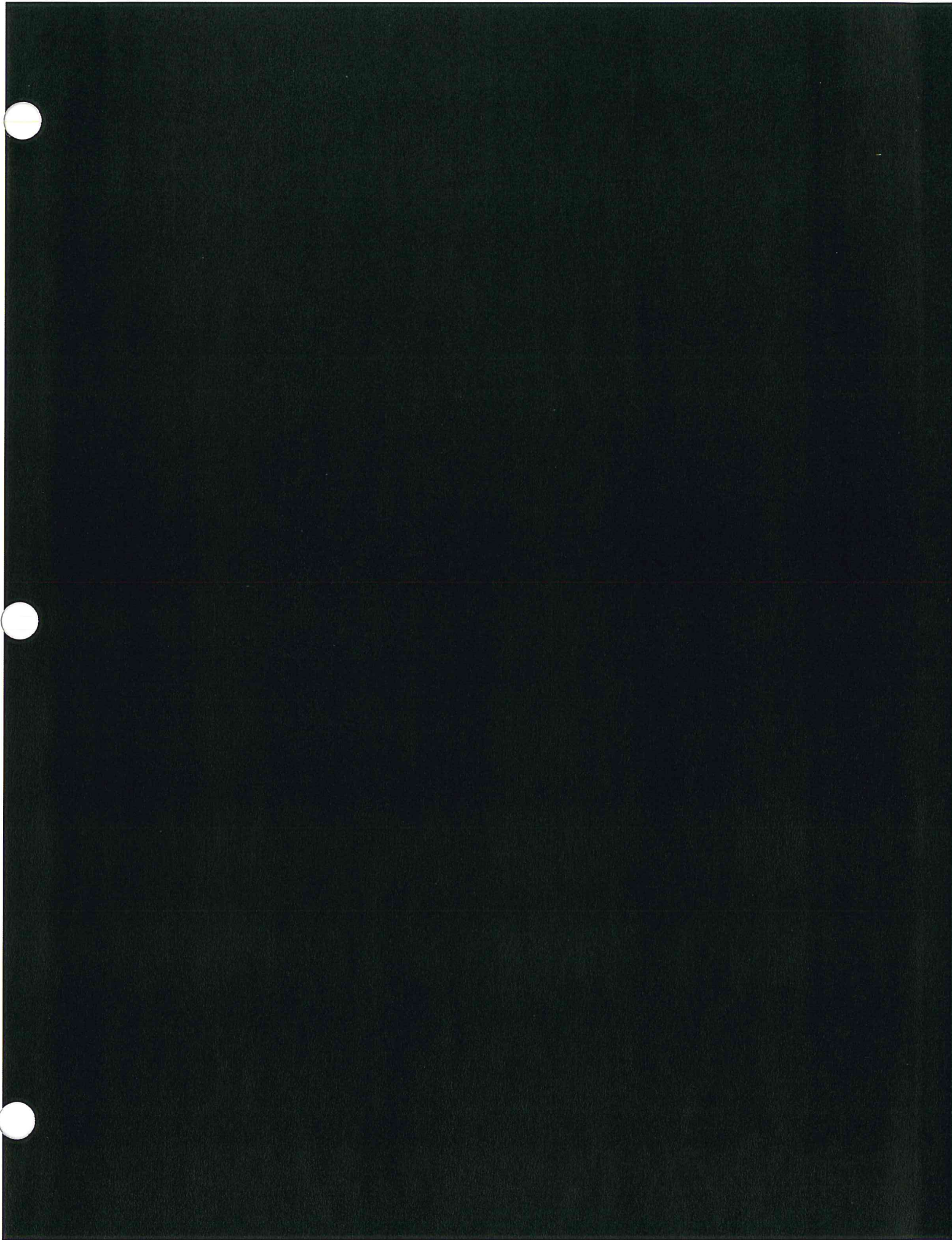




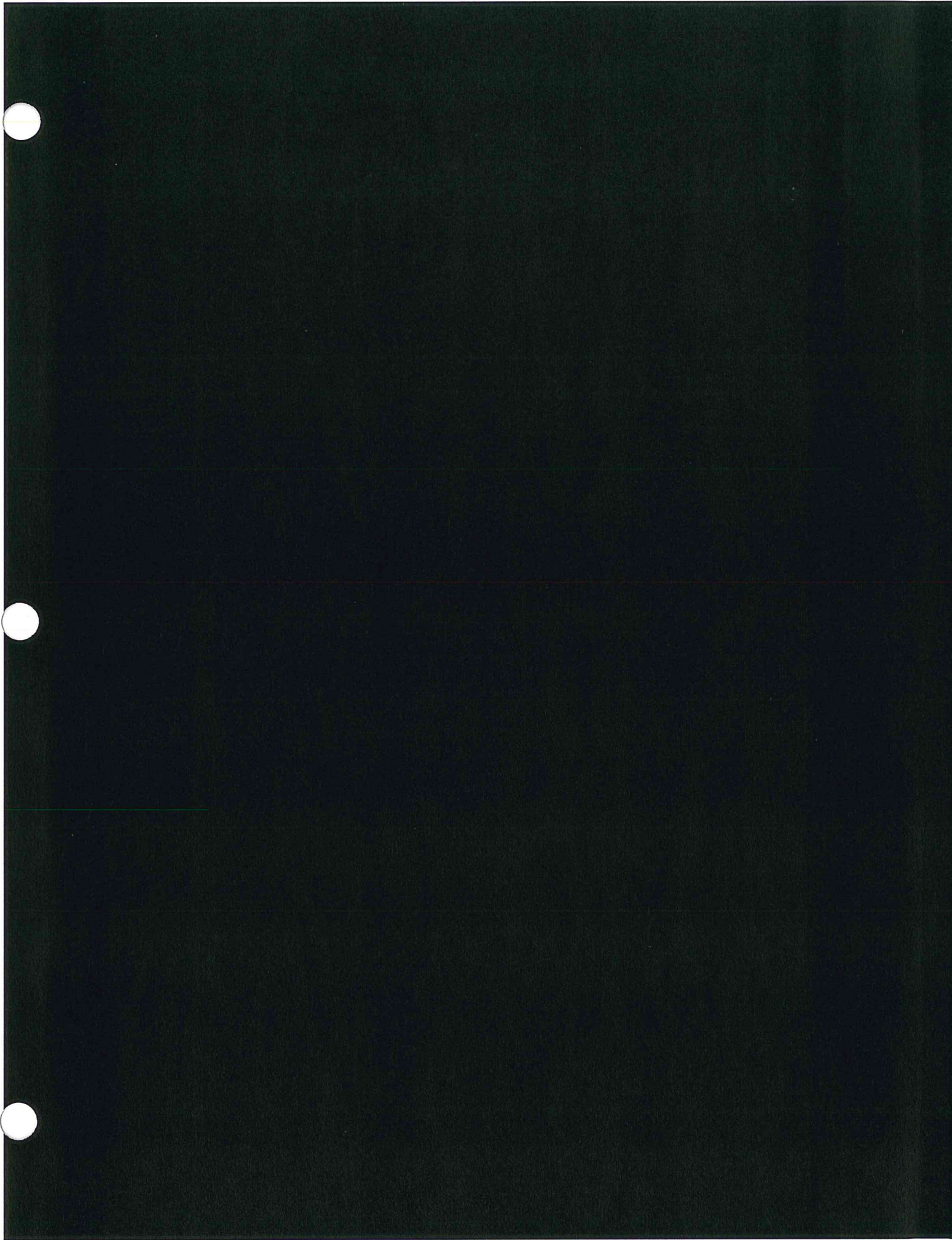




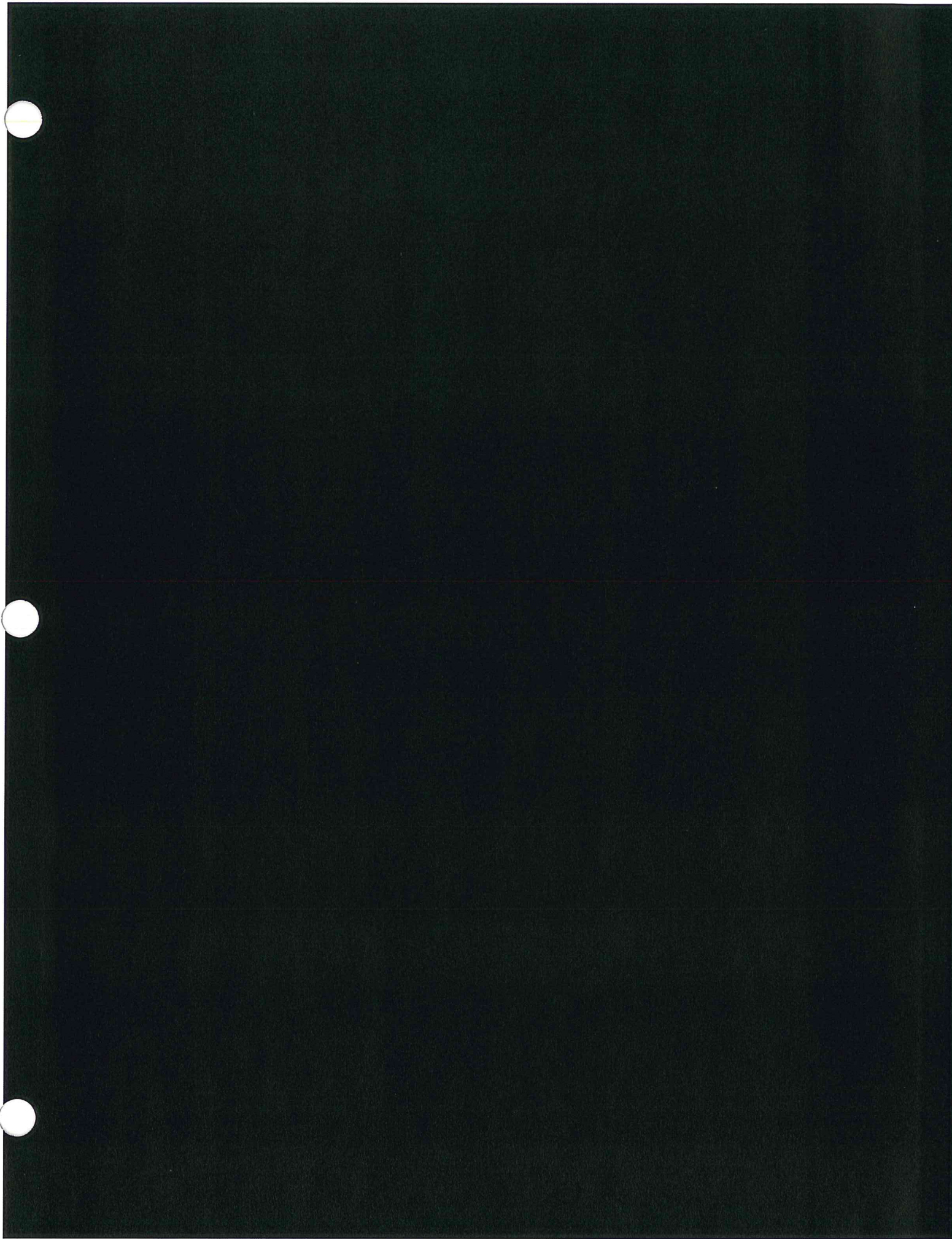














## Appendix D

### Drawings / Documents List

## Appendix D - Drawings / Documents List

Design Information			
Provided By: Gibbs Gage Architects			
Number	Name	Date Issued	Date Received
1.	IBC/MPC CBEC Report	March 17, 2017	March 17, 2017
2.	Various correspondence (emails) from Gibbs Gage	March 6 to 21, 2017	
3.	Site Visits	February 27 and March 15, 2017	
4.	CBEC meeting dated March 24, 2017	March 24, 2017	



IBC/MPC Feasibility Study - Calgary Exploratory Bid Committee

IBC Broadcast Key Requirements		BMO Hall F Expansion Only	m2/Area	Notes:	BMO Full Expansion	m2	Notes:
35,000m2 Net Clear Area		Hall A	4,489	Does not meet requirement for space. Not enough space in BOH to build additional structures to meet the required m2.	Hall A	4,489	Does not include the remaining New Exhibit 1 and 2, Meeting Rooms, Ballrooms, or Pre-Function Space. See Press BMO Full Expansion below for remaining areas.  New Exhibit A, 1, & 2 total area: 14,565m2 New Pre-Function total area: 13,219m2
		Hall B	4,387		Hall B	4,387	
		Hall C	4,539		Hall C	4,539	
		Hall D	4,500		Hall D	4,500	
		Hall E	4,422		Hall E	4,422	
		Potential Hall F	4,500		New Hall F	4,500	
		Palomino Room	1,065		Palomino Room	1,065	
		Stampede Corral	1,579		Partial New Exhibit A & 1	7,282	
			<b>Total Area:</b>			<b>35,184</b>	
		Boyce Theatre - 500 Seats	500 Seats		New Meeting Space	500 Seats	
Broadcast Briefing - 500 Seats		Commissary	Existing	Meets Requirements, however no compound space will be available.	Commissary	Existing	Meets Requirements, however no compound space will be available.
Satellite and Compound 6,000m2		BOH Area 6,000m2	Existing BOH	Meets Requirements - need study to confirm satellite angles to ensure no obstructions.	BOH Area 6,000m2	Existing BOH	Meets Requirements - need study to confirm satellite angles to ensure no obstructions. BOH configuration may have changed with new expansion - to be confirmed.
Broadcast Parking - 600 Stalls		BOH Surface Parking (290) and Casino Underground Parking (250)	540/600 Stalls	Does not meet requirements, additional parking required. Additional space may be available in transport mall area for the remaining parking.	BOH Surface Parking (290) and Casino Underground Parking (250)	540 Stalls	Does not meet requirements, additional parking required. Additional space may be available in transport mall area for the remaining parking.
Transport Mall - 2,000m2		BOH Area 2,000m2	Existing BOH	Meets Requirements for transport of 4,046m2 area - (1 Acre) area.	BOH Area 2,000m2	Existing BOH	Meets Requirements for transport of 4,046m2 area - (1 Acre) area.
Guest Pass Office - 400m2		Exterior Temporary Cabin	Existing FOH	Central location to be determined - shared with park helpout location to be confirmed.	Exterior Temporary Cabin	Existing FOH	Central location to be determined - shared with park helpout location to be confirmed. Full expansion remaining pre-function space minus required addition press build (10,061m2).
Heliport		Location TBC	TBC		Location TBC	TBC	
Main Street - IBC/MPC Services		Pre-Function Space	Unknown		New Pre-Function Space	Shared with Press	
Press/Media Key Requirements		Big Four	m2/Area	Notes:	BMO Full Expansion	m2	Notes:
20,000m2 Area		Ground Level	5,574	Does not meet requirements, space required in temporary infrastructure. See drawing and notes below.	Partial New Exhibit A, 1, & 2	7,282	Partial shared space with BRD with New Exhibit A, 1, & 2 along with minor pre-function space required for build out.
		Upper Level	5,574		New Meeting Space	6,354	
					New Ballroom Space	4,285	
					New Pre-Function Space	2,079	
		<b>Total Area:</b>	<b>11,148</b>			<b>20,000</b>	
Media Workroom 5,000m2/600 Workstations		Big Four - Upper Level	5,000	Meets Requirements for space.	Partial New Exhibit A, 1, & 2	5,000	Meets Requirements.
Agency Offices 4,100m2		Big Four - Lower Level	4,100	Meets Requirements for space.	New Ballroom Space	4,100	Meets Requirements.
Locker Area 200m2/200 Lockers		Big Four - Upper Level	200	Meets Requirements for space.	New Pre-function Space	200	Meets Requirements.
Press Conference 100m2/100 Seat, and 100 Seat Conference		Big Four - Lower Level	850-1,000	Meets Requirements for space.	New Meeting Space	200-250 and 100 Seats	Meets Requirements.
Media Dining & Kitchen 1,500m2		Tent Structure	Exterior Tent	Meets Requirements for space.	Partial New Exhibit A, 1, & 2	1,000	Combined with existing BOH food service areas.
NOC Work Area 900m2		Big Four - Upper/Lower Level	900	Meets Requirements for space.	Partial New Exhibit A, 1, & 2	900	Meets Requirements.
Press Parking - 200 Stalls		Location of Big Four, limits ability for vehicle circulation in FOH Park spectator space.	0/200 Stalls	Does not meet requirements, need to identify space for 200 parking stalls.	BOH Surface Parking (290) and Casino Underground Parking (250)	540 Stalls	Does not meet requirements, additional parking required. Additional space may be available in transport mall area for the remaining parking.
General Notes and Assumptions:		<ol style="list-style-type: none"> <li>1. Commissary and adjacent area around dedicated to BMO - any additional food service, storage, etc. to be provided by Park FAB compound.</li> <li>2. Cleaning and Waste, Logistics, Site, and Workforce Check-in and Break areas are located in shared Park compounds - small offices and storage areas to be provided at BMO. Expansion to Hall F Only and Big Four - there is not enough space for these areas.</li> <li>3. Venue Management and Security Operations to be provided within BMO.</li> <li>4. Media dining located next to the Big Four - this may need to include Broadcast dining as well - the mix between Media Services (Main Street) and Dining - further detailed layouts to confirm best flow - this will required travel between building for both BRD and PRS.</li> </ol>					

**From:** Hannah BURNS <[hannah.burns@olympic.org](mailto:hannah.burns@olympic.org)>

**Date:** Tuesday, May 23, 2017 at 2:08 PM

**To:** Jolan Storch <[jolan@boldcounsel.com](mailto:jolan@boldcounsel.com)>

**Cc:** Jennifer Dwyer <[jdwyer@olympic.ca](mailto:jdwyer@olympic.ca)>, Jacqueline Barrett <[jacqueline.barrett@olympic.org](mailto:jacqueline.barrett@olympic.org)>

**Subject:** Re: Questions for the IOC

Dear Jolan,

Please find below the feedback that we received from OBS following your email below.

- With respect to the questions from the friends in Calgary, we studied the information supplied and we also checked the information and drawings that are public on the BMO website.
- In general, we can say that the BMO seems to be suitable for IBC use, although there are certain parameters that will require a second level of attention (e.g. available headroom and other conditions that can only be judged based on more detailed architectural, mechanical and electrical information). Overall, since the BMO appears to be a functional exhibition center of a rather large size, we believe that through coordinated efforts between OBS and the local organizers we would be able to make this work without significant space modifications and satisfy the operational requirements for a Winter Games IBC.
- Specifically for the 35db noise level specification this is a uniform requirement because generally broadcasters studios are distributed across most of the spaces of the IBC. However, once the final requirements of the broadcasters are known ( 12-14 months before the Games ) we would be happy to identify spaces that will not need special sound insulation treatment and help create savings for the organizers.
- We would be happy to further discuss with the Calgary team on specific details of their proposed solution, but in principle OBS would be prepared to exert every possible flexibility to make BMO a workable solution as an IBC.

Please let us know if you have any further questions.

Thank you,  
H

**From:** Marco Delaco <[Marco.Delaco@calgarybec.ca](mailto:Marco.Delaco@calgarybec.ca)>

**Date:** Friday, May 5, 2017 at 9:43 AM

**To:** Jolan Storch <[jolan@boldcounsel.com](mailto:jolan@boldcounsel.com)>

**Cc:** Brian Hahn <[Brian.Hahn@calgarybec.ca](mailto:Brian.Hahn@calgarybec.ca)>, 'Gene Edworthy' <[gaedworthy@gmail.com](mailto:gaedworthy@gmail.com)>

**Subject:** Questions for the IOC

Jolan,

We have three questions for the IOC – specifically the Olympic Broadcast Services Team.

1. We have provided the attached summary of the existing space at our tradeshow facility. We would like to understand what the shortfall in space is from the OBS minimum requirements. Our consultants experienced some relaxation of the Host City Operational Requirements when they went through the available space on the Budapest project with OBS and these resulted in significant savings and a better



legacy. If there is any flexibility it could have a material impact on cost. The improvements and additions that we may have to add are not of a legacy nature.

2. The space summary also notes ceiling heights of the different halls. We know from experience that not all of the space needs to be at 9 metres as OBS have been able to be quite creative on where they place their own space and broadcasters space to work around shortfalls in ceiling heights. We would appreciate advice from OBS on what flexibility exists relative to our space availability as set out in the attached summary.
3. Our third question relates to the 35db acoustic rating. Does this apply to all spaces or can it be localized to certain specified spaces within the overall IBC. Most large tradeshow facilities are not constructed to a 35 db rating so we are trying to understand the scale of renovations that would be needed to meet this temporary requirement

Our team would be pleased to speak directly with OBS along with the Candidature Department if that was helpful to them in understanding our questions or attachment.

Thanks

Marco

**MARCO DE IACO**  
DIRECTOR, OLYMPIC AND PARALYMPIC BID EXPLORATION  
CALGARY BID EXPLORATION COMMITTEE

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